



Appendix A: Meeting Minutes

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Vanasse Hangen Brustlin, Inc.

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Boston, Massachusetts 02111

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Meeting Notes

Attendees: See Attached Sign-In Sheet

Date/Time: April 11, 2006; 3:30 PM

Project No.: 09736.00

Place: Visitor's Center, 175 Main
Street, Pawtucket, RI 02860

Re: Pawtucket/Central Falls Commuter Rail
Facility Feasibility Study and Site Analysis
Stakeholder Committee Meeting #1

Notes taken by: K. Wickham Zimmerman/D. Wilcock

The purpose of this first meeting was to introduce the members of the Stakeholder Committee; provide an overview of the project scope of services and schedule; and discuss the feasibility of restoring train service to Pawtucket/Central Falls. A copy of the agenda is attached for reference.

Overview of Scope and Schedule

After introductions were made, Mike Cassidy, Director of the City of Pawtucket's Department of Planning and Redevelopment, provided a brief overview of the project and explained that this project is a City of Pawtucket-led effort. The study is being managed by the City's Department of Planning and Redevelopment. Mr. Cassidy introduced the consultant team for the project.

David Wilcock, VHB Project Manager, provided an overview of the project's scope of services and schedule. He discussed the three-step approach to the study, which is designed to answer three questions: 1) Is commuter rail service to Pawtucket/Central Falls feasible?; 2) If service is feasible, which of the two sites identified is the better location for a station?; and 3) What could the station layout look like at the preferred site?.

David indicated that meetings had been held with several of the project stakeholders including Amtrak, the Massachusetts Bay Transportation Authority (MBTA), and the Rhode Island Department of Transportation (RIDOT). A brief summary of these meetings was provided. It was explained that VHB and the City initially met with RIDOT to discuss coordination of the study efforts. This meeting was followed by a meeting with the MBTA to discuss their issues and concerns regarding the feasibility of stopping trains at a Pawtucket/Central Falls Station. The MBTA's primary concerns were: 1) impact on their existing schedule, 2) train loads (crowding), and 3) the need to stop on the main line tracks. The MBTA would have significant concerns if they were asked to run the entire commuter rail service schedule (both directions) on the FRIP track between Providence and Pawtucket/Central Falls. Additionally, VHB conducted a teleconference with representatives from Amtrak to discuss their issues and concerns regarding the feasibility of stopping trains at a Pawtucket/Central Falls Station. Amtrak's primary concerns are 1) that they do not want any trains stopping on the main line tracks and 2) that their schedule not be impacted. A fourth meeting will be scheduled with the Providence & Worcester Railroad to discuss their issues and concerns.

David provided a brief description of the two sites under consideration: 1) the historic depot location; and 2) the Providence & Worcester Railroad's rail yard located about ½ mile west of the historic depot location.

The Project is scheduled to take approximately one year to complete. The scheduled completion date is January 2007. The Phase 1 analysis that examines the feasibility of restoring train service to a Pawtucket/Central Falls Station is scheduled to be complete by mid to late June 2006. The other two phases will follow in roughly four month timeframes provided that the Phase 1 finds the service to be feasible.

Stakeholder Committee Guidelines and Procedures

Kristine Wickham Zimmerman described the program for the public involvement portion of the project, including the role of the Stakeholder Committee in the project. The Public Involvement Plan, which describes the process for conducting public meetings and Stakeholder Committee meetings, was distributed to the committee for review. Guidelines for the Stakeholder Committee meetings were also distributed and reviewed (see attached).

It was asked if the proposed meeting time of 3:30 PM to 5:30 PM for Stakeholder Committee meetings was acceptable to the group. There was general consensus about holding future Stakeholder Committee meetings during this time.

It was noted that the City of Pawtucket Planning Department website will contain meeting minutes and materials from the public and Stakeholder Committee meetings.

General Discussion

After the formal presentation portion of the meeting, members of the Stakeholder Committee were asked for their input regarding the feasibility of restoring commuter rail service. The group asked a number of questions and provided specific comments and input. The following is a brief summary of the topics discussed related to the study:

- ❑ It was asked if feasibility of trains stopping at the station is the only thing being analyzed as part of this study. It was explained that the feasibility of using the two proposed sites and the existing structures, if appropriate, will also be evaluated.
- ❑ It was noted that intermodal connections at the site should be considered and that the use of alternatives modes for access/egress, such as buses and pedestrian access, be considered in accessing the station.
- ❑ It was asked if Amtrak will insist on constructing additional track(s). David Wilcock explained that Amtrak's current position is that it is their policy that they do not want trains to stop on the mainline. However, it was noted that there are several locations where this is currently occurring.
- ❑ It was asked if VHB performed the ridership forecasts for previous studies. It was explained that VHB had not done this work previously and that they are currently looking at the travel demand forecasting. It was noted that VHB will evaluate the existing ridership at Providence and South Attleboro stations to determine how many current patrons may chose to use a new facility in Pawtucket/Central Falls. These trips will redistribute accordingly and included as part of the assessment. It was also noted that the MBTA is concerned about the increase in ridership and the effect that it will have on current service and seating capacity.
- ❑ The impact of RIDOT's South County service on the ridership assessment. David explained that RIDOT and the MBTA views the South County service as plus: South County riders are expected to generally travel as far as Providence where their seat can be resold as a Providence-Boston trip. Therefore, the South County service is not expected to impact the MBTA's seat capacity. This current study will look at riders destined for both the Boston and South County markets.
- ❑ In the event that it is found that additional capacity will be required on the line, new rail cars may need to be purchased. It was explained that it can take up to three years to procure new rail cars. The maximum train length is nine coaches, which can accommodate approximately 1700 people

(if all coaches are bi-levels). Currently, most train sets to Providence have six to eight coaches (five to seven double-decker coaches and one or two single level coaches). It was noted that the MBTA can sell seats to Providence and to T.F. Green Airport for the reverse commute, however, this does not help with addressing the limited seat availability to Boston.

- ❑ It was asked if the existing platform congestion at Back Bay Station will be addressed in the form more elevators, escalators, etc. It was explained that the platform capacity at Back Bay Station will not be handled as part of this project.
- ❑ A follow-up question was asked about the track capacity at South Station. It was stated that if the MBTA gets additional right-of-way from the Post Office Annex, it might be possible to expand terminal capacity by up to four tracks. These new tracks would likely service only the Old Colony and Fairmount Line trains. The additional tracks however would help relieve terminal congestion issues for the Attleboro/Providence Line service at South Station.
- ❑ Concerns about parking and traffic congestion at the proposed sites were expressed. Impacts on traffic and available on-street parking will affect nearby residents. It was explained that parking will be evaluated based on the projected ridership and that peak period traffic analyses will be conducted. Parking at the station will be investigated based on demand and overflow parking can be evaluated in the future if needed. It was also noted that enforcement of on-street parking will need to be provided by local officials.
- ❑ Traffic improvements such as signalization, left-turn lanes and other opportunities will need to be evaluated at critical intersections. Pedestrian traffic will also need to be evaluated.
- ❑ Opportunities for transit-oriented development will also be investigated as part of this study.
- ❑ It was asked if a survey of the potential users of the facility will occur during this study. It was stated that although a formal survey will not be conducted, it will be possible to make projections as to the projected usage. The 2000 Census Data can be utilized to make some of these determinations. Additionally, license plate survey data for Providence and South Attleboro stations was provided by RIDOT.
- ❑ The Pawtucket Alliance for Downtown Services (PADS) is interested in investigating opportunities for use of the public space at the train station. David Wilcock explained that the third phase of the study will look at the opportunities that exist around the commuter rail service. It was noted that when the building was built in the early 1900s, it was a symbol of the City and that there is an opportunity for this to happen again.
- ❑ It was explained that if the train service is not found to be feasible, then the project will stop and that the funds allocated for the study will not be further expended.
- ❑ David Wilcock explained that the operations analysis will determine only the feasibility of stopping trains at the station. It is unlikely by the end of this analysis that there will be a firm commitment by Amtrak or the MBTA on the service. However, it will be possible to determine in general if train service can stop at either the existing station or the P&W yard.
- ❑ Ike Seelbinder, the current developer for the property, was asked for a status of his project. Mr. Seelbinder stated that the development project is moving forward, although it was delayed due to Amtrak's lowering of the P&W line. Additionally, there have been several structural and architectural issues identified recently. It was stated that Amtrak may have undercut the support structures and that there may be cracks in the foundation. The structural integrity of the walls and building are being evaluated. Mr. Seelbinder stated that he intends to change the exterior of the building to make it more attractive and safer. When asked if the wood chips pile would be removed, it was explained that Amtrak has limited the developer's ability to address concerns such as these.

Next Steps

A public meeting is scheduled for May 18, 2006 at 7PM. The purpose of this first public meeting will be to introduce the public to the project and to obtain input regarding the study. Notices will be sent out and advertised in the local newspapers.

Technical elements of the study, such as the structural inspections, historic evaluations, operational analysis, ridership estimates, traffic analysis and Phase 1 Site Assessment are currently being conducted.

Attachments:

- Sign-In Sheet
- Agenda
- Stakeholder Committee Guidelines and Procedures
- Printout of Powerpoint Slideshow

DCW/KWZ/dw/kz

xc: Attendees, File

Meeting Attendance Sheet

Please initial if in attendance and mark any changes or additions to the information provided.

| | | |
|-----------------------------|--------------------------------|---|
| Date: April 11, 2006 | Time: 3:30 PM – 5:30 PM | Location: Visitor's Center, 2nd Fl., 175 Main Street, Pawtucket, RI 02860 |
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Stakeholder Committee

| Initials | Name | Organization | Address | Tel.No. | Email |
|----------|-----------------------------------|--|--|-----------------------|--|
| | Tom Moritz | Amtrak | 30th Street Station 2nd Floor South, Box 21 Philadelphia, PA 19104 | | moritzt@amtrak.com |
| S.A. | Silvia Acevedo | Barton Street Neighborhood Association | c/o PCDC 210 West Avenue Pawtucket, RI 02860 | 401-726-1173 | silviaacevedo@pawtucketcdc.com |
| ES | Jan Moore PAUL REDKOVICH | Blackstone Valley Community Action Program | 32 Goff Avenue Pawtucket, RI 02860 | 401-723-4520 | janbvcap@hotmail.com redkovich@yahoo.com |
| | President Jason R. Ledger, Jr. | Central Falls City Council | 21 Temple Place Central Falls, RI 02863 | | |
| | Mayor Charles Moreau | City of Central Falls | 53 Broad Street Central Falls, RI 02863 | | |
| Jgm | Joseph G. Nield, Director | City of Central Falls Department of Public Works | 530 Broad Street Central Falls RI 02863 | 401-727-7466 | neoi@centralfallsri.us |
| | Mayor James Doyle | City of Pawtucket | | | |
| | Tom Cahir | Executive Office of Transportation | 10 Park Plaza, Suite 3170 Boston, MA 02116 | | |
| | Garfield Spencer | First National Development | 2490 Black Rock Tnkp PMB 333 Fairfield, CT 06825 | | |
| | Richard Goldstein | Government Affairs, City of Pawtucket | 137 Roosevelt Avenue Pawtucket RI 02860 | | |
| | Dennis DiZoglio | MBTA | 10 Park Plaza; Room 5750 Boston, MA 02116 | 617-222-4292 | ddizoglio@mbta.com |
| | Jody Ray | MBTA | 45 High Street, 8th Floor Boston, MA 02111 | | |
| dtg | John J. Garrahy | Moses & Afonso Inc. | 170 Westminster Street Suite 201 Providence, RI 02903 | 401-453-3600 | jgarrahy@moses&afonso.com |
| | Paul L. Ouellette | Northern Rhode Island Chamber of Commerce- Central Falls Advisory Group and Pawtucket Advisory Group | 6 Blackstone Valley Place SUITE 301 LINCOLN, RI 02865 | 401-334-1000 117 | pouellette@nrchamber.com |
| | John P. Mitchell | | P.O. Box 881058 St. Lucie West, FL 34988-1058 | 772-475-6030 | |
| 28 | Maia Small | PADS 10 Exchange Ct. #406, Pawtucket | 28 Bayley Street, Unit #502 Pawtucket, RI 02860 | 401-316-5708 | mattkierstead@cox.net maia@thurlowsmall.com |
| | Herb Weiss | Pawtucket Arts Collaborative City of Pawtucket | 175 Main St 3rd Fl Pawtucket RI 02860 | 745-500 | weiss@psdri.net |
| | President Donald Greblen | Pawtucket City Council | 137 Roosevelt Avenue Pawtucket RI 02860 | 401-728-0500 | DRGREBL@LEVINSON.COM |
| | Patrick Morganelli | Pawtucket Housing Authority | 214 Roosevelt Avenue Pawtucket RI 02860 | 401-725-9113 | patrickm@pawthousing.org |
| | Major Arthur Martins | Pawtucket Police Department | 121 Roosevelt Avenue Pawtucket RI 02860 | 401-727-9100, Ext 716 | amartins@pawtucketpolice.com |
| WTO | Nancy Whit | Pawtucket Citizens Development Corporation | 210 West Avenue Pawtucket RI 02860 | 401-726-1173 | nancywhit@pawtucketcdc.com |
| JP | Paul Mowrey Joseph Palmer | Preservation Society of Pawtucket | 67 Park Place Pawtucket RI 02860 | 401-725-9581 | pawtucket.preservation@verizon.net |
| | Marianela Dougal, Deputy Director | Progreso Latino | 626 Broad Street Central Falls, RI 02863 | 401-728-5920 | |
| MR | Bernard Cartier | Providence and Worcester Railroad | 75 Hammond Street Worcester, MA 01610 | 508-459-4545 | bernie@pwrr.com |
| | Steve Devine | Rhode Island Department of Transportation | 2 Capital Hill, Room 372 Providence, RI 02903-1190 | 401-222-4203 | sdevine@dot.state.ri.us |
| ES | Ike Seelbinder | SMPO Properties, Inc. | 3526 Spottswood Avenue P.O. Box 11568 Memphis, TN 38111 | 901-327-7676 | |
| | Elaine A. Coderre | State Representative - City of Pawtucket | 18 Angle Street Pawtucket RI 02860 | 401-726-1190 | |
| | Joseph L. Faria | State Representatives City of Central Falls | 112 Clay Street Central Falls, RI 02863 | | |

Please initial if in attendance and mark any changes or additions to the information provided.

Location: Visitor's Center, 2nd Fl.,
175 Main Street, Pawtucket, RI 02860

Project Team:

| | | | | | |
|--|---------------|-----|---------------------------------------|--------------|--|
| | David Wilcock | VHB | 38 Chauncy Street Boston, MA 02111 | 617-728-7777 | dwilcock@mbta.com |
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**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility
Study and Site Analysis**

Stakeholder Committee Meeting No. 01

**Visitor's Center
2nd Floor Conference Room
175 Main Street
Pawtucket, RI 02860**

**April 11, 2006
3:30 PM - 5:30 PM**

- 1. Introductions**
- 2. Study Purpose**
- 3. Overview of Project Scope of Services and Schedule**
 - **Phase I: Train Service Feasibility**
 - **Phase II: Analysis and Comparison of Two Sites**
 - **Phase III: Evaluation and Site Design for the Preferred Commuter Rail Station Site Option**
- 4. Stakeholder Committee Participation and Groundrules**
- 5. Phase I: Train Service Feasibility**
 - **General Requirements of a Commuter Rail Station**
 - **Station Stop at Historic Location**
 - **Station Stop at P&W Yard**
 - **Existing Operations**
 - **Operational Issues**
 - **MBTA**
 - **Amtrak**
 - **Providence & Worcester Railroad**
- 6. Next Steps**
 - **Public Meeting - May 18, 2006**
 - **Structural Inspections**
 - **Historic Evaluation**
 - **Operational Analysis**
 - **Ridership Estimates**
 - **Traffic Analysis**

**Pawtucket/Central Falls Commuter Rail Feasibility Study
and Alternatives Analysis
Stakeholder Committee**

GUIDELINES AND PROCEDURES

Vanasee Hangen Brustlin, Inc. (VHB), with guidance from the Cities of Pawtucket and Central Falls, has invited interest groups from the communities of Pawtucket and Central Falls to be represented on a Stakeholder Committee for the Commuter Rail Facility Feasibility Study and Alternatives Analysis. The group includes residents, elected and municipal officials and/or their representatives, and other interested parties. City staff and members of the Project Team, led by VHB, will also participate in the meetings.

Goals

The primary role of the Stakeholder Committee is to review and discuss key information, data and alternatives for the proposed commuter rail service. Work will include commenting on the Purpose and Need for the project; data collected for the project; the criteria developed to evaluate the alternatives; the conceptual alternatives and screening process; and other technical and general information, such as environmental and cost issues. Community involvement and input will help define an acceptable and implementable project for the region.


Guidelines for Participation

1. The members of the Stakeholder Committee have been identified as having a past and/or current interest in the commuter rail service or facility. The public is welcome to attend the committee meetings as observers. A 10-minute public comment period will be set aside at each meeting for comments or questions from observers.
2. The Stakeholder Committee will seek to achieve consensus on the proposals or alternatives; in the absence of a consensus, the opinions of the parties will be recorded in a written summary and taken into consideration by the Project Team. The opinions of the community are an important element in the process of developing alternatives, but the City, who must ultimately approve a preferred alternative, has to follow guidelines relating to feasibility, level of technical difficulty, environmental laws and regulations, and state and federal funding guidelines. The Project Team values the contributions and opinions of the community and the individual participants, but reminds the Stakeholder Committee that the City retains final decision making authority with regard to the project.

3. For the Stakeholder Committee to be effective, the parties have to take their roles and responsibilities seriously. The Project Team commits to the following responsibilities: to schedule meetings on a regular basis that will allow the participants to consider issues and offer timely comments; to consider and respond to these comments and issues; to provide understandable and accurate data and project information; to provide timely notice of meetings, with agendas; and to record and distribute accurate summaries of the discussions. Members of the Project Team will participate in the meetings and will serve as a resource to the committee.
4. Members of the Stakeholder Committee are expected to: learn about the issues relevant to the project; disseminate this information to the community or segment of the community they represent; and advise the Project Team of their opinions and those of their community in a timely manner. It is anticipated that members of the Stakeholder Committee will listen to the various viewpoints of the committee, and shall not have a vested interest in the outcome of the study.
5. In the case of a Public Meeting, the community members will participate and encourage others to learn about the project and share their opinions in writing or at the meeting.
6. All participants are requested to listen to the opinions of others in an effort to ensure a constructive discussion. Personal attacks will only detract from the goal of the Stakeholder Committee, and are not appropriate.
7. We understand that members of the Stakeholder Committee have many personal and professional commitments aside from this one. However, we do ask that members of the Stakeholder Committee make every possible effort to attend the meetings consistently. Anyone who misses more than two meetings in a row will find it difficult to participate in the work of the committee effectively.
8. Participants are encouraged to stay focused on and limit the discussion to the issues on the meeting agendas. Issues related to other projects that do not have a bearing on the Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Alternatives Analysis are not appropriate.

The Project Team appreciates the time and effort that individuals commit to this kind of project and thank them for representing their communities and working to enhance the planning process.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility



Pawtucket/Central Falls Commuter Rail Facility – Stakeholder Committee Meeting #1

April 11, 2006

Yonasson Hargens Brundin, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Project Approach

- A focused, deliberate approach that sequentially addresses the three fundamental questions:
 - ▷ Phase I - *Is Commuter Rail Service Feasible?*
 - ▷ Phase II - *Which Site Provides the Best Opportunities?*
 - ▷ Phase III - *What Will the Site Look Like? How Will It Impact the Community?*

Yonasson Hargens Brundin, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Phase I – Feasibility Analysis: *Is Commuter Rail Service to Pawtucket/ Central Falls Feasible?*

- Rail Operations
- Track and Systems
- Equipment



Yonasson Hargens Brundin, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Phase II – Site Conditions Analysis: *Which of the Two Sites Provides the Best Opportunities?*

- Site Conditions Analysis
 - ▷ Layout
 - ▷ Access
 - ▷ Environmental
- Transit Oriented Development
- Finance and Funding




Yonasson Hargens Brundin, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Phase III – Evaluation and Site Design: *What Will the Site Look Like and How Will It Impact the Community?*

- Evaluation
- Vision
 - ▷ Design
 - ▷ Site Access
 - ▷ Parking
- Public Process



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PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Stakeholder Committee

- Committee Involvement
- Public Involvement Plan
- Groundrules



Yonasson Hargens Brundin, Inc.

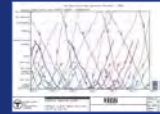
Phase I – Train Service Feasibility Analysis

- General Requirements
- Station Stops
 - ▷ Historic Location
 - ▷ P&W Yard
- Existing Operations
- Operational Issues
 - ▷ MBTA
 - ▷ Amtrak
 - ▷ Providence & Worcester Railroad



Rail Operations

- South Station Capacity
- PM Peak Period Corridor Constraints
- Coordination with Other RI Rail Initiatives



Track and Systems

- Signal System Design
- Track Geometry
- Platform Layout



Equipment

- Ridership
 - ▷ Providence/Attleboro Line
 - ▷ Other RI Commuter Rail Initiatives
- Consist (Train) Make-up
- Impact Analysis



Next Steps

- Public Meeting – May 18, 2006
- Structural Inspections
- Historic Evaluation
- Operations Analysis
- Ridership Estimates
- Traffic Analysis
- Phase 1 Site Assessment

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Meeting Notes

Attendees: See Attached Sign-In Sheet

Date/Time: October 3, 2006; 3:30 PM

Project No.: 09736.00

Place: Visitor's Center, 175 Main
Street, Pawtucket, RI 02860

Re: Pawtucket/Central Falls Commuter Rail
Facility Feasibility Study and Site Analysis
Stakeholder Committee Meeting #2

Notes taken by: K. Wickham Zimmerman/M. Dixon

The purpose of the second Stakeholder Committee meeting was to introduce the results of the first phase of the project; provide an overview of the scope of services and schedule for the next phase; and discuss the process of evaluating the alternative sites. A copy of the agenda is attached for reference.

Results of Phase I Analysis

After introductions were made, Mayor James Doyle of Pawtucket provided a brief overview of the results of the Phase I analysis. He noted that VHB concluded that service was feasible, and that given the existing MBTA schedule, 23 of 30 trains could stop at Pawtucket/Central Falls. He noted that 14,000 workers live within a mile of the historic station, and that commuter rail service would provide the community with better access to employment and education in both Providence and Boston. He also noted that there are some challenges, such as Amtrak's concerns about mainline stops. The next phase of the project will be to determine which site is best, what a station on that site would look like, and how the station would impact the community.

David C. Wilcock, VHB Project Manager, recapped the three-step approach to the study, which is designed to answer three questions: 1) Is commuter rail service to Pawtucket/Central Falls feasible?; 2) If service is feasible, which of the two sites identified is the better location for a station?; and 3) What could the station layout look like at the preferred site?.

DCW explained that VHB had concluded Phase I activities and found that commuter rail service to Pawtucket/Central Falls is feasible. He proceeded to present the detailed results of Phase I tasks, including operations analysis, ridership forecast, and structural evaluation of the historic station building.

DCW introduced the scope of the operations analysis used to determine the physical viability of stopping trains in Pawtucket/Central Falls without impacting the existing users of the Northeast Corridor (NEC). These users include Amtrak's inter-city service, the Massachusetts Bay Transportation Authority's (MBTA) existing commuter rail service, and the Providence and Worcester Railroad (P&W) freight service. DCW noted the concerns of these users, such as Amtrak's concern about stopping trains on the mainline tracks and P&W's concern about platform clearances on the freight (FRIP) track. He also stated that service to Pawtucket/Central Falls would need to be

coordinated with the Rhode Island Department of Transportation's (RIDOT) plans to extend commuter rail service to South County.

DCW explained the assumptions used for the operations analysis. The schedule was based on Amtrak's Spring 2006 schedule, the MBTA's July 2006 schedule, and the most recent P&W freight schedule. It was assumed that a station stop at Pawtucket/Central Falls would add 3 minutes to the scheduled running time, that trains need 10 minutes to change direction at Providence, and that MBTA and Amtrak trains should be separated by at least 10 minutes at Providence Station. Any train violating these constraints could not be stopped at Pawtucket/Central Falls.

DCW stated that based on these schedules and assumptions, 23 of the 30 existing scheduled trains could stop at Pawtucket/Central Falls, including 6 of 7 during AM peak and 5 of 6 during PM peak. Two peak hour trips would also provide service to and from Providence. DCW asked for questions or comments:

- Tom Moses asked if the analysis had also been done using the MBTA's optimal turn time of 20 minutes. DCW said that the turn time of 10 minutes had been used to mimic actual times used today.

DCW proceeded to introduce the ridership forecast, including the ridership shed areas for both auto and alternative modes of access. The ridership forecast was based on the 2000 Census, the 2000 Journey to Work, the RIDOT statewide model, the Central Transportation Planning Staff (CTPS) regional model (Massachusetts), Rhode Island Public Transit Authority (RIPTA) bus schedules, and MBTA fares and schedules. DCW stated that in 2030 there would be an estimated 1100 riders to Boston, 250-550 to Providence, and 150-170 to TF Green Airport. Between 64% and 74% would drive to the station, 13% would be dropped off, 11-23% would walk, and remaining users would take transit. He stated that these numbers were in line with MBTA experience at stations in similar settings with similar demographics, and asked for questions or comments:

- Nancy Callaghan asked for clarification about what was meant by inbound trips. It was explained that these were AM peak trips to the destinations, i.e. Pawtucket to Boston and Pawtucket to Providence.
- Richard Davis asked what stations on the MTBA system were comparable demographically. It was stated that Hyde Park is the most similar in terms of demographics and land use. Canton Center is similar in land use, but not demographics. Stoughton is as well, but to a lesser extent.
- Nancy Callaghan asked what demographic statistics were compared. It was explicated that household characteristics such as income, employment, size, and vehicle ownership were considered, in conjunction with land use and density around the sites.
- Tom Moses asked if an interim analysis for a year before 2030 had been performed. It was explained that only the projection for 2030 had been done, as the FTA requires a 20-year outlook, but that other years could be projected.
- Nancy Callaghan asked if there was an opening date for the station. DCW stated that there is no opening date yet, as this will depend on the outcome of the alternatives analysis, the design process, and funding availability.

DCW then continued to the final task of Phase I, the structural evaluation of the historic station. He cautioned that the analysis was only for the concrete slab spanning the tracks, and the columns and girders supporting the slab. The floor slab is in satisfactory condition. The girders, which run between the columns supporting the slab, are in fair to poor condition. The columns are in fair to good condition. All structural elements are in need of some repair, but there is nothing that cannot be fixed. The floor was then opened to questions and comments.

- Ike Seelbinder asked if the lowering of the Freight Rail Improvement Project (FRIP) track had caused undermining or weakening of the footings for the columns or retaining walls. DCW stated that this had not been examined in Phase I, and would be taken into consideration should the historic station site be identified as the preferred alternative.
- Mike Cassidy asked if the analysis had been done before or after the lowering of the FRIP track. DCW responded that it had been done in March 2006, after the lowering of the FRIP.
- Ike Seelbinder asked if the footings issue would be studied in detail. It was explained that it would be examined in detail if the existing building is to be reused.
- Nancy Callaghan noted that any damage can be repaired for some cost, and asked if any estimate of repair costs had been made. It was stated that no repair cost estimate had been made, but that the cost was something that would be generally taken into consideration during the alternatives analysis.

Overview of Phase II Scope

DCW explained what the consultant team would be doing for the Phase II site evaluation. The team will consider the layout, access, environmental impact, traffic impact, Phase I structural assessment, and historic impact for each alternative. The three alternatives are reuse of the historic station, use of the historic station parcel with a new structure, and use of the P&W Pawtucket Yard. The criteria by which each alternative will be evaluated fall into three broad categories, including transportation, environmental, and cost and constructability.

Transportation criteria include traffic impacts, accessibility, permanent impact to rail operations, parking supply, ridership, access to opportunity, and consistency with transportation planning policies. Environmental criteria include noise and vibration, air quality, land use compatibility, economic effects, relocations, TOD opportunities, and environmental justice. Cost & constructability criteria include capital cost, constructability, and temporary impacts to rail operations. DCW again asked for questions and comments:

- Richard Davis asked if it was possible to construct platforms at both sites. It was explained that it was possible at both, but easier at the yard because the track is on a tangent.
- Joseph Palmer asked about operations at the P&W yard, noting that some tracks appear to be abandoned. DCW stated that regardless of the status of the existing tracks, the project would be obliged to replace the rail yard with an in-kind facility at the railroad's direction.
- Richard Davis noted that the current tenant at the P&W yard is subleasing short term.
- Tom Moses inquired about the Phase II schedule. DCW noted that there is a public meeting on October 24 to present the same information as today's meeting, and that the team expects to complete Phase II activities within two months.
- Steve Devine inquired about the need for additional tracks or crossovers as part of the project. DCW responded that this need would be considered as part of Phase II, and that there can be a premium for this type of work.
- Richard Davis asked if the issue with trains stopping on the mainline is more related to schedule difficulties than technical problems. DCW stated that it is Amtrak's position that trains should not stop on the mainline because stops are the most common location where breakdowns occur. Breakdowns in the mainline cause cascading delays to Amtrak's intercity service. DCW noted that the project will need to work with Amtrak to try to resolve this issue without building two additional tracks.
- Richard Davis asked how many states on the Northeast Corridor have mainline stops. DCW stated that all states on the NEC have mainline station.

- Joseph Palmer noted that trains stop in the mainline at Route 128 station and Canton Junction station, both of which were recently reconstructed. DCW noted that at Route 128, there is a provision for an additional track if needed, and that the Stoughton branch was separated from the mainline at Canton Junction, resulting in fewer mainline stops. Steve Devine stated that Amtrak took this position only recently, beginning with the T.F. Green station project. He noted that as the owner of the corridor, Amtrak has the ultimate say in operations.
- Ike Seelbinder asked how the criteria would be evaluated and ranked. DCW responded that there will be a matrix scoring system, with each alternative assigned a score for each of the criteria. The alternative with the highest score will become the preferred alternative.
- Nancy Callaghan noted that the criteria are subjective, and do not reflect costs. DCW stated that the criteria is subjective, but that costs would be included in the overall cost estimate for each alternative and in the cost and constructability criteria.
- Maia Small asked if the results of the analysis would be available before the design was advanced. DCW stated that at the next meeting, the team will present the alternative concepts, the screening process, and the initial results and preferred alternative. The committee will then be able to comment on the analysis.
- Richard Davis asked if the criteria would be weighted. DCW responded that there may be some criteria more important than others, and that, if applicable, these would be identified during Phase II.
- Nancy Callaghan asked how costs would be estimated. DCW stated that they would be estimated using schematic designs and costs for the different components from similar projects.
- Ike Seelbinder asked if there had been input from the MBTA and RIDOT for railroad costs. DCW noted that the team had met with RIDOT, P&W, MBTA, and Amtrak on several occasions to discuss and understand these issues.
- Ike Seelbinder asked if P&W had indicated a preference for either site. DCW responded that they had not.
- Steve Devine asked if new equipment, such as cars or engines, would be required. DCW stated that this would be included under the analysis of cost and constructability, and would depend on the level of ridership.
- Tom Moses asked if anyone from P&W was present. No representative was present.
- Tom Moses asked if P&W supported the conversion of their yard to a station. DCW and Mike Cassidy responded that they had not ruled out use of the yard, and have been cooperative during the process.

Next Steps

A public meeting is scheduled for Tuesday, October 24, 2006 at 7PM. The purpose of the meeting will be to introduce the public to the results of the Phase 1 analysis and the scope of Phase II activities. The team will be working on Phase II activities, as well as identifying opportunities for transit oriented development and financing options. After Phase II is completed, the team will begin work on a concept design for the preferred alternative.

Attachments:

- Sign-In Sheet
- Agenda
- Printout of Powerpoint Slideshow

MD/md

xc: Attendees, File

Meeting Attendance Sheet

Please initial if in attendance and mark any changes or additions to the information provided.

| | | |
|------------------------------|--------------------------------|---|
| Date: October 3, 2006 | Time: 3:30 PM – 5:30 PM | Location: Visitor's Center, 2nd Fl., 175 Main Street, Pawtucket, RI 02860 |
|------------------------------|--------------------------------|---|

Stakeholder Committee

| Initials | Name | Organization | Address | Tel.No. | Email |
|------------|---|--|--|-----------------------|--|
| | Tom Moritz | Amtrak | 30th Street Station 2nd Floor South, Box 21 Philadelphia, PA 19104 | | moritzt@amtrak.com |
| <i>SLB</i> | Silvia Acevedo Shandi Brown | Barton Street Neighborhood Association | c/o PCDC 210 West Avenue Pawtucket, RI 02860 | 401-726-1173 | silviaacevedo@pawtucketcdc.com shandibrown@pawtucketcdc.com |
| | Paul Redkovich | Blackstone Valley Community Action Program | 32 Goff Avenue Pawtucket, RI 02860 | 401-723-4520 | predkovich@yahoo.com |
| | President Jason R. Ledger, Jr. | Central Falls City Council | 21 Temple Place Central Falls, RI 02863 | | |
| | Mayor Charles Moreau | City of Central Falls | 53 River Street Central Falls, RI 02863 | | |
| | Joseph G. Nield, Director | City of Central Falls Department of Public Works | 53 River Street Central Falls, RI 02863 | 401-727-7466 | neol@centralfallsri.us |
| <i>JD</i> | Mayor James Doyle | City of Pawtucket | | | |
| | Tom Cahir | Executive Office of Transportation | 10 Park Plaza, Suite 3170 Boston, MA 02116 | | |
| | Garfield Spencer | First National Development | 2490 Black Rock Tnpk PMB 333 Fairfield, CT 06825 | | |
| | Richard Goldstein | Government Affairs, City of Pawtucket | 137 Roosevelt Avenue Pawtucket RI 02860 | | |
| | Dennis DiZoglio | MBTA | 10 Park Plaza; Room 5750 Boston, MA 02116 | 617-222-4292 | ddizoglio@mbta.com |
| <i>Leg</i> | Jody Ray | MBTA | 45 High Street, 8th Floor Boston, MA 02111 | | |
| <i>Jim</i> | John J. Garrahy | Moses Afonso Jackvony | 170 Westminster Street Suite 201 Providence, RI 02903 | 401-453-3600 | jgarrahy@mosesafonso.com |
| | Paul L. Ouellette | Northern Rhode Island Chamber of Commerce– Central Falls Advisory Group and Pawtucket Advisory Group | 6 Blackstone Valley Place Suite 301 Lincoln, RI 02865 | 401-334-1000 ext. 117 | pouellette@nrchamber.com |
| <i>Jul</i> | John P. Mitchell | | P.O. Box 881058 St. Lucie West, FL 34988-1058 | 772-475-6030 | THEMITCH@MAC.COM |
| <i>MS</i> | Maia Small | PADS | 10 Exchange Court, #406 Pawtucket, RI 02860 | 401-316-5708 | maia@thurlowsmall.com |
| <i>AW</i> | Herb Weiss | City of Pawtucket | 175 Main Street, 3rd Floor Pawtucket, RI 02860 | 401-724-5200 | weissh@psdri.net |
| <i>CS</i> | President Donald Grebien | Pawtucket City Council | 137 Roosevelt Avenue Pawtucket RI 02860 | 401-728-0500 | dgrebien@leviton.com |
| <i>PM</i> | Patrick Morganelli | Pawtucket Housing Authority | 214 Roosevelt Avenue Pawtucket RI 02860 | 401-725-9113 | patrickm@pawthousing.org |
| <i>AM</i> | Major Arthur Martins | Pawtucket Police Department | 121 Roosevelt Avenue Pawtucket RI 02860 | 401-727-9100, Ext 716 | amartins@pawtucketpolice.com |
| <i>NTW</i> | Nancy Whit | Pawtucket Citizens Development Corporation | 210 West Avenue Pawtucket RI 02860 | 401-726-1173 | nancywhit@pawtucketcdc.com |
| <i>SA</i> | Joseph Palmer | Preservation Society of Pawtucket | 67 Park Place Pawtucket RI 02860 | 401-725-9581 | pawtucket.preservation@verizon.net |
| | Marianela Dougal, Deputy Director | Progreso Latino | 626 Broad Street Central Falls, RI 02863 | 401-728-5920 | |
| | Bernard Cartier | Providence and Worcester Railroad | 75 Hammond Street Worcester, MA 01610 | 508-459-4545 | bernie@pwrr.com |
| <i>SD</i> | Steve Devine | Rhode Island Department of Transportation | 2 Capital Hill, Room 372 Providence, RI 02903-1190 | 401-222-4203 | sdevine@dot.state.ri.us |
| | Mark Therrien | RIPTA | | | |
| <i>OK</i> | Ike Seelbinder | SMPO Properties, Inc. | 5858 Ridgeway Center Parkway Memphis, TN 38120 | 901-327-7676 | |
| | Elaine A. Coderre | State Representative - City of Pawtucket | 18 Angle Street Pawtucket RI 02860 | 401-726-1190 | |

Please initial if in attendance and mark any changes or additions to the information provided.

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| Date: October 3, 2006 | Time: 3:30 PM – 5:30 PM | Location: Visitor's Center, 2nd Fl., 175 Main Street, Pawtucket, RI 02860 |
|------------------------------|--------------------------------|---|

Stakeholder Committee

| | | | | | |
|--|-----------------|---|--|--|---------------|
| | Joseph L. Faria | State Representatives City of Central Falls | 112 Clay Street Central Falls, RI 02863 | | |
| | RD Billington | PRESIDENT BLACKSTONE VALLEY TOURISM COUNCIL | 175 MAIN ST PANTUCKET 02863 | | TSVRI@aol.com |

Project Team:

| | | | | | |
|-----|----------------------------|---|---|--------------|--|
| WJX | Mike Cassidy | City of Pawtucket, Department of Planning and Redevelopment | 175 Main Street Pawtucket, RI 02860 | 401-724-5200 | cassidy@psdri.net |
| RCD | Richard Davis | Pawtucket Foundation | PO Box 515 Pawtucket, RI 02860 | 401-725-4400 | rcd@pawtucketfoundation.org |
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| | Barney Heath | City of Pawtucket, Department of Planning and Redevelopment | 175 Main Street Pawtucket, RI 02860 | 401-724-5200 | heathb@psdri.net |
| | Susan Mara | City of Pawtucket, Department of Planning and Redevelopment | 175 Main Street Pawtucket, RI 02860 | 401-724-5200 | maras@psdri.net |
| | Kristine Wickham Zimmerman | VHB | 38 Chauncy Street Boston, MA 02111 | 617-728-7777 | kwickham@mbta.com |
| | David Wilcock | VHB | 38 Chauncy Street Boston, MA 02111 | 617-728-7777 | dwilcock@mbta.com |

Others:

[illegible]

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility
Study and Site Analysis**

Stakeholder Committee Meeting No. 02

**Visitor's Center
2nd Floor Conference Room
175 Main Street
Pawtucket, RI 02860**

**October 3, 2006
3:30 PM - 5:30 PM**

- 1. Introductions**
- 2. Status of Study**
- 3. Phase I: Train Service Feasibility - Summary**
 - Operational Analysis
 - Ridership Estimates
 - Structural Reviews
- 4. Phase II: Analysis and Comparison of Two Sites - Progress**
 - Site Evaluations - Historic Station and P&W Yard
 - Screening and Ranking of Alternatives
- 5. Next Steps**
 - Public Meeting - October 24, 2006
 - Evaluation of Alternatives
 - Transit-Oriented Development Analysis
 - Project Financial Evaluations
 - Evaluation and Site Design for the Preferred Commuter Rail Station Site Option



Pawtucket/Central Falls Commuter Rail Facility – Stakeholder Committee Meeting #2

October 3, 2006

Yonasson Hanger Brantley, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Project Agenda

- Phase I: Train Service Feasibility-Summary
- Phase II: Analysis and Comparison of Two Sites – Progress
- Next Steps

Yonasson Hanger Brantley, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Phase I – Feasibility Analysis: *Is Commuter Rail Service to Pawtucket/ Central Falls Feasible?*

- Operational Analysis
- Ridership Estimates
- Structural Evaluation



Yonasson Hanger Brantley, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Operational Analysis - Considerations

- No adverse impact on existing services
- Amtrak: *no stopping on Mainline*
- MBTA/P&W: *FRIP capacity*
- P&W: *freight clearances*
- MBTA: *schedule impacts*
- RIDOT: *South County service*



Yonasson Hanger Brantley, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Operational Analysis - Assumptions

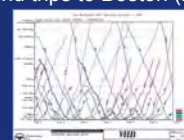
- Amtrak Spring 2006 schedule
- MBTA 2006 schedule
- New station stop – 3 minutes
- MBTA turn times – 10 minutes
- Conflicts
 - ▷ Scheduled MBTA departure <10 minutes ahead of Amtrak
 - ▷ Scheduled MBTA arrival <10 minutes ahead of Amtrak
 - ▷ Providence turns <10 minutes

Yonasson Hanger Brantley, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Operational Analysis - Results

- 23 of 30 weekday trips can stop at Pawtucket/Central Falls
- AM Peak – 6 of 7 Inbound trains stop
- PM Peak – 5 of 6 Outbound trains stop
- 2 Outbound trips to Providence (AM Peak)
- 2 Inbound trips to Boston (PM Peak)



Yonasson Hanger Brantley, Inc.

Ridership - Assumptions

- 2000 Census
- 2000 Journey-to-Work
- RIDOT Statewide Model
- CTPS Regional Model
- RIPTA Schedules
- MBTA Fare Structure and Schedules



Ridership – Capture Areas



Ridership - Results

- **2030 Inbound Boardings**
 - ▷ To Boston: 1100
 - ▷ To Providence: 250-550
 - ▷ To T.F. Green: 150-170
- **Access**
 - ▷ Park: 64%-74%
 - ▷ Kiss and Ride: 13%
 - ▷ Transit: 1%
 - ▷ Walk: 11%-23%



Structural Evaluation

- **Floor slabs**
 - ▷ Satisfactory condition
- **Girders**
 - ▷ Fair to poor condition
- **Columns**
 - ▷ Fair to good condition



Phase II – Site Conditions Analysis: Which of the Two Sites Provides the Best Opportunities?

- **Site Evaluations**
 - ▷ Layout
 - ▷ Access
 - ▷ Environmental
 - ▷ Traffic
 - ▷ Phase 1 Site Assessment
 - ▷ Historic Evaluation



Site Conditions Analysis – Evaluation Criteria

- **Transportation**
 - ▷ Traffic impacts
 - ▷ Accessibility
 - ▷ Impact on Rail Operations
 - ▷ Parking Supply
 - ▷ Ridership
 - ▷ Access to opportunity
 - ▷ Consistency with Transportation Planning and Policies



Site Conditions Analysis – Evaluation Criteria

- **Environmental**

- ▷ Noise & Vibration
- ▷ Air Quality
- ▷ Compatibility with Land Use
- ▷ Economic Effects
- ▷ Relocations
- ▷ TOD opportunities
- ▷ Environmental Justice



Site Conditions Analysis – Evaluation Criteria

- **Cost and Constructability**

- ▷ Capital Cost
- ▷ Constructability
- ▷ Impacts on Rail Operations (during construction)



Next Steps

- Public Meeting – October 24, 2006
- Evaluation of Alternatives
- Transit-Oriented Development
- Project Financial Evaluations
- Concept Design for Preferred Alternative

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Meeting Notes

Attendees: See Attached Sign-In Sheet

Date/Time: December 4, 2006; 3:30 PM

Project No.: 09736.00

Place: Visitor's Center, 175 Main
Street, Pawtucket, RI 02860

Re: Pawtucket/Central Falls Commuter Rail
Facility Feasibility Study and Site Analysis
Stakeholder Committee Meeting #3

Notes taken by: K. Wickham Zimmerman/M. Dixon

The purpose of the third Stakeholder Committee meeting was to introduce the results of the second phase of the project, including concept designs for both sites; to provide an overview of the scope of services and schedule for the next phase. A copy of the agenda is attached for reference.

Introduction

Introductions were made by Mike Cassidy, Director of the Department of Planning and Redevelopment for the City of Pawtucket.

David C. Wilcock, VHB Project Manager, recapped the three-step approach to the study, which is designed to answer three questions: 1) Is commuter rail service to Pawtucket/Central Falls feasible?; 2) If service is feasible, which of the two sites identified is the better location for a station?; and 3) What could the station layout look like at the preferred site?

DCW explained that VHB had concluded activities for Phases I and II, noting under Phase I it was determined that commuter rail service to Pawtucket/Central Falls is feasible, as explained at the October 3, 2006 Stakeholder Committee meeting. He proceeded to introduce the goals of Phase II tasks, including design criteria, concept designs for both alternative sites, evaluation methodology for screening alternatives, screening criteria, and ratings and rankings.

Phase II Concepts

DCW introduced the design standards for the project. Railway components of the project will be subject to Amtrak, Massachusetts Bay Transportation Authority (MBTA), and Providence and Worcester Railroad (PWRR) design standards. Roadway aspects will be subject to American Association of State Highway and Transportation Officials (AASHTO) and Rhode Island Department of Transportation (RIDOT) design standards.

DCW proceeded to introduce Alternative 1 – Historic Station Site with Access from Historic Station Building. The concept plan, included as an attachment, was shown and explained in detail. Primary access would be via the station building, with secondary access from Jenks Street or Cross Street.

and run north, the same location as Alternative 2, and be connected to the station by a fenced walkway. He asked for questions and comments:

- Nancy Whit asked if all vehicular access to the garage would be from Montgomery Street. It was stated that this concept shows the main access from Montgomery Street with a secondary access from Broad Street, but that this is just one possible layout for the site. If this site is advanced, the location of access might change based on traffic or other considerations.
- Tom Moses asked how far it was to walk from Broad Street to the platform. It was estimated that the distance was 350 feet. Tom noted that the end of the platform would then be about ¼ mile from the entrance.
- Tom Moses asked if ADA accessibility had been considered. It was noted that the building would have to be modified to be ADA accessible. Ike Seelbinder noted that it might be difficult to do so.
- Tom Moses asked if costs had been considered. It was stated that costs would be discussed later in the presentation.
- Tom Moses noted that Montgomery Street is residential, and that parking might not be allowed abutting such a district. Sue Mara stated that parking would be allowed.
- Tom Moses asked if the team had considered having no vehicular access from Broad Street or locating all vehicular access on Montgomery Street. It was stated that those options had not been considered for this concept, but that they were design possibilities.
- Tom Moses asked if the garage would be self-park. It was stated that it was likely to be self-park.

DCW then proceeded to introduce Alternative 2 – Historic Station Site with Access from Clay Street. The concept plan, included as an attachment, was shown and explained in detail. Primary access would be via the Clay Street bridge, with secondary access from Jenks Street or Cross Street. Elevators would be located at Clay Street. A garage would be provided as described in Alternative 1. Platforms would begin near Clay Street and run north, the same location as Alternative 1. He then asked for questions and comments:

- Tom Moses asked if the platform location was the same for both alternatives. It was stated that the location was the same, running from Clay Street north past Cross Street.
- Ike Seelbinder asked if the team had developed an alternative without the historic building shown on site. It was stated that Alternative 2 does not use the building, but still includes it.
- Tom Moses asked if the team had considered other locations for parking, closer to the platforms. It was stated that though this concept did not show parking in other locations, it could be possible to move or split the parking in other concepts.
- RIPTA asked if the team had considered kiss-and-ride requirements to avoid a haphazard queue of cars waiting for the train to arrive. It was stated that the team had determined the expected number of kiss-and-ride passengers based on demographically similar stations in the MBTA system, and that pick-up/drop-off requirements would be addressed during design if a concept was advanced.

DCW introduced Alternative 3 – PWRR Pawtucket Yard Site. The concept plan, included as an attachment, was shown and explained in detail. Primary access would be via the intersection of Goff Avenue and Pine Street, with secondary access from Conant Street. Parking for 700-750 vehicles would be provided by a combination of a surface lot and a structure. He then asked for questions and comments:

- Nancy Whit asked if there had been a resolution to the issue concerning Amtrak's desire to have no commuter rail stops on the mainline tracks. It was stated that on the Northeast Corridor, all states have commuter stops on the mainline. It was also noted that it would be difficult to fit in station sidings at either site, and that the MBTA would consider stopping on a side track a detriment to their operations.
- Steve Devine noted that Amtrak's insistence on this issue had resulted in \$40-50 million in cost increases on the Airport station project, and that RIDOT had decided to use the FRIP track for that station stop. It was noted that both PWRR and the MBTA have concerns about using the FRIP track for a station stop.
- Joseph Palmer asked what would become of the yard, should Alternative 3 move forward. It was stated that the site would have to be purchased and that a suitable site for relocation would also be needed.
- Nancy Whit asked what the area of each site is. It was stated that the yard site is about 7-8 acres and the historic site is about 3.5 acres.
- Ike Seelbinder asked if the team considered stopping commuter trains on a siding in the PWRR yard. It was stated that this option had been considered, but not advanced.
- Ike Seelbinder asked if the yard site could be fall back option in the event that Amtrak would not relent on allowing trains to stop on the mainline. It was stated that it was possible, but that the MBTA might not want to operate the service in such a case. Steve Jones noted that it would be difficult for the MBTA to operate the Providence line as a single track line in this area.
- Joseph Palmer asked if the tracks in the corridor were bi-directional. It was stated that although they are bi-directional, it is preferable to always operate one track exclusively in each direction.
- Steve Devine asked why the platform was so far north in Alternatives 1 and 2. It was stated that the platform needed to start far enough north that it would be off the worst part of the horizontal curve at the station site. Amtrak's design criteria prohibit a high platform on a curve greater than 1 degree 40 minutes. It was noted the team laid out a viable platform under the station, but that an Amtrak design waiver would be required.
- Steve Devine asked if the station would have full high platforms. It was stated that both concepts included this feature. Steve Jones noted that in the MBTA's experience, low platforms increase dwell time at station stops.
- Paul Mowrey asked what relocating the yard would entail. It was stated that the yard would have to be replaced in function, not necessarily layout, to give the railroad the ability to serve operations in the foreseeable future.
- Paul Mowrey noted that the yard seemed abandoned before, but that there is now activity. It was noted that the level of activity could change either way.

Evaluation Methodology

DCW then introduced the evaluation methodology. Alternatives were ranked against the screening criteria in an absolute manner, so it is possible for all alternatives to have a negative or positive score. Ratings are from -10 to +10 in increments of 5. He recapped the evaluation criteria, as introduced in the October 3, 2006 Stakeholders' Committee meeting, and included as an attachment. He then introduced the ratings and rankings table, as included as an attachment. The historic station site showed a score of +25, while the yard site scored 0. He then asked for questions and comments:

- Ike Seelbinder noted that there were no environmental issues with the former gas station on the Central Falls side of the historic site.
- Nancy Whit noted that in the evaluation criteria, relocation had been described under both environmental and cost and constructability, but only scored under cost and constructability. It was stated that relocation had been included under environmental in error.
- Shandi Brown asked if transit-oriented development (TOD) included residential and commercial development. It was stated that TOD can consist of many different types of uses, and that TOD can be considered both on-site and in the surrounding area.

Project Costs

DCW proceeded to introduce conceptual costs for the project, as included as an attachment. Capital costs are estimated to be \$25-\$50 million, incidental costs up to \$35 million, and operations and maintenance costs \$0.8-\$1.0 million annually. He then asked for questions and comments:

- Tom Moses asked if there was a separate estimate for each alternative. It was stated that individual estimates would not be provided at this stage.
- Tom Moses asked for more detail on the capital costs. It was stated that \$20-\$30 million consists of work for the station itself (platforms, access, parking, circulation); the remainder represents costs such as railroad improvements.
- Tom Moses asked if the \$25 million number was realistic. It was state that absent any changes to the railroad, \$25 million was a viable number.
- Nancy Whit asked who would be responsible for operations and maintenance costs. It was stated that the railroad would be responsible for platforms, but the remainder would be the responsibility of the community or state. Steve Jones noted that the railroad maintains the tracks and platforms, due to the proximity to operating trains.
- Nancy Whit asked if there would be revenue sharing of fares. Steve Jones and Steve Devine stated that there was not, and that that farebox money belonged to the MBTA.
- Joseph Nield asked if operations and maintenance costs generally fall to the communities. It was stated that this assessment is true in general.
- Tom Moses, Steve Devine, and Mike Cassidy engaged in a discussion about the eligibility of the project for federal funding if a portion of the historic building were demolished by private interests. Ike Seelbinder asked if the team had experience in a similar situation. It was stated that the team was unsure if it had previously encountered the same set of legal conditions.
- Nancy Whit asked if TOD was expected to increase revenues to cover operations and maintenance costs. Mike Cassidy stated that these costs could be covered in many ways, such as tax revenue, parking revenue, and TOD revenue.
- Ike Seelbinder asked if PWRR had indicated a willingness to work on a non-cost basis, and noted that his interests would consider a mutually beneficial public/private partnership. It was stated that this was not in the scope of work for this study.
- Shandi Brown asked if the team would take further action to get the community involved in the project. She noted that many residents have more than one job, making it difficult for them to attend public meetings. It was stated that during the next phase of the project, the team and the city would work with neighborhood associations to develop community input.

- Tom Moses asked where match money would come from. It was stated that this had not been determined at this stage of the project.

Overview of Phase III Activities

Phase III activities will include a concept design for the preferred alternative, TOD analysis, and financial evaluations.

Next Steps

A public meeting will be scheduled for January of 2007. The purpose of the meeting will be to introduce the public to the results of the Phase II analysis and the scope of Phase III activities.

Attachments:

- Sign-In Sheet
- Agenda
- Printout of Powerpoint Slideshow

MD/md

xc: Attendees, File

Meeting Attendance Sheet

Please initial if in attendance and mark any changes or additions to the information provided.

| | | |
|-------------------------------|--------------------------------|---|
| Date: December 4, 2006 | Time: 3:30 PM – 5:30 PM | Location: Visitor's Center, 2nd Fl., 175 Main Street, Pawtucket, RI 02860 |
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
Stakeholder Committee

| Initials | Name | Organization | Address | Tel.No. | Email |
|----------|---------------------------------|--|--|-----------------------|--|
| | Tom Moritz | Amtrak | 30th Street Station 2nd Floor South, Box 21 Philadelphia, PA 19104 | | moritzt@amtrak.com |
| SB | Shandi Brown | Barton Street Neighborhood Association | c/o PCDC 210 West Avenue Pawtucket, RI 02860 | 401-726-1173 | shandibrown@pawtucketcdc.com |
| PL | Paul Redkovich | Blackstone Valley Community Action Program | 32 Goff Avenue Pawtucket, RI 02860 | 401-723-4520 | predkovich@yahoo.com |
| | President Jason R. Ledger, Jr. | Central Falls City Council | 21 Temple Place Central Falls, RI 02863 | | |
| | Mayor Charles Moreau | City of Central Falls | 53 River Street Central Falls, RI 02863 | | |
| JSM | Joseph G. Nield, Director | City of Central Falls Department of Public Works | 53 River Street Central Falls, RI 02863 | 401-727-7466 | neoj@centralfallsri.us |
| | Mayor James Doyle | City of Pawtucket | | | |
| | Tom Cahir | Executive Office of Transportation | 10 Park Plaza, Suite 3170 Boston, MA 02116 | | |
| BB | Bob Billington | Blackstone Valley Tourism Council | 125 Main St Pawtucket, RI 02860 | | bvri@aol.com |
| | Garfield Spencer | First National Development | 2490 Black Rock Trpk PMB 333 Fairfield, CT 06825 | | |
| RG | Richard Goldstein | Government Affairs, City of Pawtucket | 137 Roosevelt Avenue Pawtucket RI 02860 | 788-0500x357 | rgoldstein@pawtucketri.com |
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| | Steve Jones | MBTA | 45 High Street, 8th Floor Boston, MA 02111 | | |
| Tom | John J. Garrahy Tom Moses | Moses Afonso Jackvony | 170 Westminster Street Suite 201 Providence, RI 02903 | 401-453-3600 | jgarrahy@moses&afonso.com |
| | Paul L. Ouellette | Northern Rhode Island Chamber of Commerce– Central Falls Advisory Group and Pawtucket Advisory Group | 6 Blackstone Valley Place Suite 301 Lincoln, RI 02865 | 401-334-1000 ext. 117 | pouellette@nrchamber.com |
| | John P. Mitchell | | P.O. Box 881058 St. Lucie West, FL 34988-1058 | 772-475-6030 | themitch@mac.com |
| MS | Maia Small | PADS | 10 Exchange Court, #406 Pawtucket, RI 02860 | 401-316-5708 | maia@thurlowsmall.com |
| | Herb Weiss | City of Pawtucket | 175 Main Street, 3rd Floor Pawtucket, RI 02860 | 401-724-5200 | weissh@psdri.net |
| | President Donald Grebien | Pawtucket City Council | 137 Roosevelt Avenue Pawtucket RI 02860 | 401-728-0500 | dgrebien@leviton.com |
| | Patrick Morganelli | Pawtucket Housing Authority | 214 Roosevelt Avenue Pawtucket RI 02860 | 401-725-9113 | patrickm@pawthousing.org |
| | Major Arthur Martins | Pawtucket Police Department | 121 Roosevelt Avenue Pawtucket RI 02860 | 401-727-9100, Ext 716 | amartins@pawtucketpolice.com |
| NW | Nancy Whit | Pawtucket Citizens Development Corporation | 210 West Avenue Pawtucket RI 02860 | 401-726-1173 | nancywhit@pawtucketcdc.com |
| JP | Joseph Palmer | Preservation Society of Pawtucket | 67 Park Place Pawtucket RI 02860 | 401-725-9581 | pawtucket.preservation@verizon.net |
| PM | Paul Mowrey | Preservation Society of Pawtucket | 67 Park Place Pawtucket RI 02860 | 401-725-9581 | pawtucket.preservation@verizon.net |
| | Mariana Dougal, Deputy Director | Progreso Latino | 626 Broad Street Central Falls, RI 02863 | 401-728-5920 | |
| | Bernard Cartier | Providence and Worcester Railroad | 75 Hammond Street Worcester, MA 01610 | 508-459-4545 | bernie@pwrr.com |
| SD | Steve Devine | Rhode Island Department of Transportation | 2 Capital Hill, Room 372 Providence, RI 02903-1190 | 401-222-4203 | sdevine@dot.state.ri.us -ri.gov |
| MT | Mark Therrien | RIPTA | 265 Melrose Prov. 02907 | 401-784-9500 152 | mtherrien@RIPTA.com |



Please initial if in attendance and mark any changes or additions to the information provided.

| | | |
|-------------------------------|--------------------------------|---|
| Date: December 4, 2006 | Time: 3:30 PM – 5:30 PM | Location: Visitor's Center, 2nd Fl., 175 Main Street, Pawtucket, RI 02860 |
|-------------------------------|--------------------------------|---|

Stakeholder Committee

| | | | | | |
|--|-------------------|--|--|--------------|--|
|  | Ike Seelbinder | SMPO Properties, Inc. | 5858 Ridgeway Center Parkway Memphis, TN 38120 | 901-327-7676 | |
| | Elaine A. Coderre | State Representative - City of Pawtucket | 18 Angle Street Pawtucket RI 02860 | 401-726-1190 | |
| | Joseph L. Faria | State Representatives City of Central Falls | 112 Clay Street Central Falls, RI 02863 | | |
| | | | | | |

Project Team:

| | | | | | |
|--|----------------------------|---|---|--------------|--|
|  | Mike Cassidy | City of Pawtucket, Department of Planning and Redevelopment | 175 Main Street Pawtucket, RI 02860 | 401-724-5200 | cassidym@psdri.net |
| | Richard Davis | Pawtucket Foundation | PO Box 515 Pawtucket, RI 02860 | 401-725-4400 | rcd@pawtucketfoundation.org |
| | Arthur Hanson | City of Central Falls | 580 Broad Street Central Falls, RI 02863 | 401-727-7480 | alhanson@centralfallsri.us |
| | Barney Heath | City of Pawtucket, Department of Planning and Redevelopment | 175 Main Street Pawtucket, RI 02860 | 401-724-5200 | heathb@psdri.net |
|  | Susan Mara | City of Pawtucket, Department of Planning and Redevelopment | 175 Main Street Pawtucket, RI 02860 | 401-724-5200 | maras@psdri.net |
| | Kristine Wickham Zimmerman | VHB | 38 Chauncy Street Boston, MA 02111 | 617-728-7777 | kwickham@mbta.com |
| | David Wilcock | VHB | 38 Chauncy Street Boston, MA 02111 | 617-728-7777 | dwilcock@mbta.com |

Others:

[illegible]

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility
Study and Site Analysis**

Stakeholder Committee Meeting No. 03

**December 4, 2006
3:30 – 5:30 PM**

- 1. Overall Project Status**
- 2. Concept Designs and Features**
 - **P/CF Historic Station – Concepts 1 and 2**
 - **P&W Railyard – Concept 1**
- 3. Screening and Ranking of Alternatives**
 - **Evaluation Methodology**
 - **Screening Criteria**
 - **Ratings and Rankings**
- 4. Next Steps**



Pawtucket/Central Falls Commuter Rail Facility – Stakeholder Committee Meeting #3

December 4, 2006

Yonasson Hargens Brantley, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Project Agenda

- Overall Project Status
- Concept Designs
- Screening and Ranking of Alternatives
- Next Steps

Yonasson Hargens Brantley, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Project Status to Date

- Phase I Analysis Completed
- Concept Designs of Alternatives
- Evaluation Methodology for Screening Alternatives
- Screening Criteria
- Ratings and Rankings

Yonasson Hargens Brantley, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Concept Designs - Design Criteria

- Amtrak
- MBTA
- PWRR
- AASHTO
- RIDOT



Yonasson Hargens Brantley, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Concept Design – Historic Station Site

- Alternative 1 – Access from Historic Station Building
- Alternative 2 – Access from Clay Street



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Alternative 1 – Historic Station Site



Yonasson Hargens Brantley, Inc.

Alternative 1 – Historic Station Site

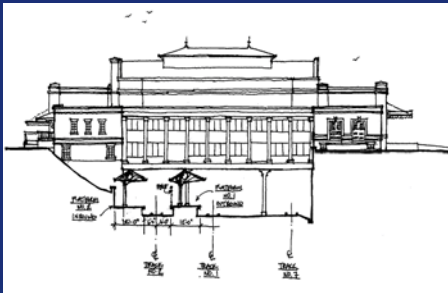
- Access from existing historic station building
- Secondary access from Jenks and/or Cross Street
- Platforms serve Tracks 1 and 2
- Elevators in existing elevator shafts
- Parking garage - 105 spaces/floor



Alternative 2 – Clay Street Access



Alternative 2 – Section



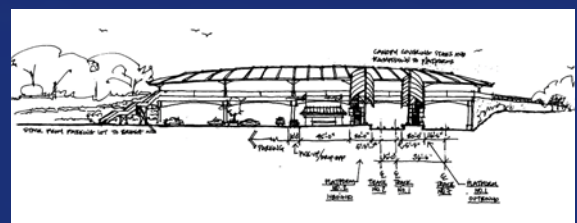
Alternative 2 – Design Features

- Primary access from Clay Street
- Secondary access from Jenks and/or Cross Streets
- Platforms serve Tracks 1 and 2
- Elevators to platforms in new elevator shafts from Clay Street
- Parking garage - 105 spaces/floor

Alternative 3 – PWRR Railyard Site



Alternative 3 – PWRR Railyard Site



Concept Design – PWRR Railyard Site

- Access intersection of Goff and Pine Streets
- Secondary access from Conant Street
- Platforms serve Tracks 1 and 2
- Surface parking for 250 spaces



Screening and Ranking of Alternatives

- Methodology
 - ▷ Compare to Screening Criteria
 - ▷ Ratings are absolute, not relative
 - ▷ Ratings: -10 to +10, in increments of 5

Screening Criteria

- **Transportation**
 - ▷ Traffic impacts
 - ▷ Accessibility
 - ▷ Impact on Rail Operations
 - ▷ Parking Supply
 - ▷ Ridership
 - ▷ Access to opportunity
 - ▷ Consistency with Transportation Planning and Policies



Screening Criteria

- **Environmental**
 - ▷ Noise & Vibration
 - ▷ Air Quality
 - ▷ Compatibility with Land Use
 - ▷ Economic Effects
 - ▷ Relocations
 - ▷ TOD opportunities
 - ▷ Environmental Justice



Screening Criteria

- **Constructability**
 - ▷ Constructability
 - ▷ Impacts on Rail Operations (during construction)
 - ▷ Business Relocations



Ranking of Alternatives - Ratings

- 10: Strongly exhibits negative characteristics for that criterion
- 5: Exhibits some negative characteristics for that criterion
- 0: Neutral or does not have a noticeable impact for that criterion
- + 5: Exhibits some positive characteristics for that criterion
- + 10: Strongly exhibits positive characteristics for that criterion

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Rating and Ranking of Alternatives

| | Historic Station Site | P&W Yard Site |
|---|-----------------------|---------------|
| Transportation | | |
| Traffic impacts | -5 | -5 |
| Accessibility | 10 | 5 |
| Impact on railroad operations (permanent) | 0 | 0 |
| Parking supply | 5 | 5 |
| Recreation | 5 | 5 |
| Access to opportunity | 10 | 5 |
| Consistency w/ transportation policies | 5 | 5 |
| Environmental | | |
| Hazardous materials | -5 | -10 |
| Noise and vibration | 0 | 0 |
| Air quality | -5 | -10 |
| Compatibility w/ land use | 10 | 5 |
| Economic impact | 5 | 5 |
| TOD opportunities | 5 | 5 |
| Environmental justice | 5 | 0 |
| Constructability | | |
| Constructability | -5 | 0 |
| Impact on railroad operations (temporary) | -10 | -5 |
| Business relocations | -5 | -10 |
| Total Score | 25 | 0 |

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PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Costs

| | Alternative 1&2 – Historic Station Site | Alternative 3 – PWRR Rail yard Site |
|--|--|---|
| Capital Costs | \$58,100,000 | \$23,800,000 |
| O&M Costs | \$1,000,000 | \$800,000 |
| Incidental Costs (relocations, acquisitions, etc.) | \$0 | \$14,200,000 |
| Total | \$59,100,000 | \$38,800,000 |

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Next Steps

- Concept Design for Preferred Alternative
- Transit-Oriented Development Analysis
- Project Financial Evaluations

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11

Screening of Alternatives

This chapter summarizes the process that was undertaken to screen the two alternative sites for a commuter rail station in Pawtucket/Central Falls. The first section describes the method of evaluating and comparing the sites. The following section introduces the criteria by which the suitability of each site was assessed.

Screening Process

The Pawtucket/Central Falls commuter rail facility evaluation process was conducted using a matrix to weigh the two alternative sites against a set of evaluation criteria developed by the study team. For each of the criteria, each alternative was given a score of -10, -5, 0, +5, or +10, as summarized below:

- - 10 indicates that the alternative strongly exhibits negative characteristics for that criterion
- - 5 indicates that the alternative exhibits some negative characteristics for that criterion
- 0 indicates that the alternative is neutral or does not have a noticeable impact for that criterion
- + 5 indicates that the alternative exhibits some positive characteristics for that criterion
- + 10 indicates that the alternative strongly exhibits positive characteristics for that criterion

Rankings are absolute, not relative, so it is possible for both alternatives to have positive or negative scores for a given criterion.

Screening Criteria

Evaluation criteria were established for the purpose of selecting a preferred alternative between the two alternatives considered. The evaluation criteria have been developed based the Federal Transit Administration's (FTA's) New Starts project justification criteria. The evaluation criteria and methodology for this project have been developed with the objective of incorporating all the key indicators appropriate for a project of this type at this stage of project development. In some cases, evaluation criteria from the FTA have been consolidated or renamed, but their intent remains consistent with the source documents.

Criteria were identified that addressed Transportation, Environmental, and Constructability considerations. The following are brief descriptions of the criteria that were used in evaluating the alternative sites for the commuter rail station.

Transportation

The following criteria related to transportation concerns were used to evaluate and screen the site alternatives:

- Traffic impacts: Would the trips generated by commuters driving to the station cause significant impact to the operation of adjacent city streets?
- Accessibility: What would be the opportunities for accessing the site by other modes of transportation, such as walking or cycling? How many potential riders are close enough to walk or cycle to the station?
- Impact on rail operations: Would the alternative cause permanent impacts to existing rail operations, such as platform clearance issues or speed restrictions?
- Parking supply: Would the alternative provide enough on-site parking to prevent surrounding neighborhoods from being subjected to overflow vehicles?
- Ridership: How many riders would the alternative attract, and how would those riders access the station?
- Access to opportunity: Would the alternative make additional employment, cultural, and educational opportunities available to the neighborhoods in which it is located?
- Consistency with transportation planning policies: Is the alternative consistent with city and state transportation plans?



Environmental

The following criteria related to environmental concerns were used to evaluate and screen the site alternatives:

- Hazardous materials: What is the potential for the presence of contaminated materials on site?
- Noise and vibration: Would commuter rail service at the alternative create unacceptable levels of noise or vibration at sensitive receptors?
- Air quality: Would the alternative cause improvement, deterioration, or no change of local and regional air quality?
- Compatibility with land use: Are current and proposed land uses on and around the alternative compatible with a commuter rail facility?
- Economic effects: Would the alternative affect municipal tax revenue through the conversion of taxable land to publicly held land? Would the alternative stimulate housing and economic development in the cities?
- Relocations: Does the alternative require acquisition of privately owned property or relocation of tenants, owners, or users of privately owned property?
- TOD opportunities: Does the site present opportunities for transit-oriented development, both on-site and in the surrounding community?
- Environmental justice: Does the alternative create unfair environmental consequences for an economically disadvantaged community?



Constructability

The following criteria related to constructability concerns were used to evaluate and screen the site alternatives:

- Constructability: Does the alternative exhibit characteristics that may adversely affect construction cost and schedule, such as difficult subsurface conditions or restricted work hours?
- Impact on rail operations (during construction): Would the alternative cause temporary impacts to existing rail operations, such as delays or speed restrictions?
- Business relocations: Is the alternative dependent on issues such as permitting and relocation of existing privately held facilities?

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Meeting Notes

Attendees: See Attached Sign-In Sheet

Date/Time: May 29, 2007; 3:30 PM

Project No.: 09736.00

Place: Visitor's Center, 175 Main
Street, Pawtucket, RI 02860

Re: Pawtucket/Central Falls Commuter Rail
Facility Feasibility Study and Site Analysis
Stakeholder Committee Meeting #4

Notes taken by: M. Dixon

The purpose of the fourth Stakeholder Committee meeting was: to introduce the results of the third phase of the project including 10% concept design for the preferred site, financial analysis, and transit-oriented development (TOD) analysis; provide an overview of the planning for implementation; and a summary of the project next steps. A copy of the agenda is attached for reference.

Introduction

David C. Wilcock, VHB Project Manager, explained that the VHB Team had substantially completed activities for all three phases of the study. He proceeded to introduce the goals of the Phase III tasks including developing a 10% conceptual design for the preferred site option, performing a project financial analysis, conducting neighborhood workshops and TOD analysis, and planning for implementation.

10% Conceptual Design and Costs

DCW introduced the 10% concept design for a commuter rail stop at the preferred site - the historic station site. The concept plan, included as an attachment to these notes, was shown and explained in detail. Platforms would be located between Clay Street and Pacific Street on the outside of the tracks (between Tracks 1 and 7 outbound, between Track 2 and the edge of the right-of-way inbound). Platforms will be full 800-foot high-level platforms, including ADA ramps, canopy, lighting, electronic signs, and other amenities.

DCW explained that key features of the design were flexibility in the location of access points from the street to the platforms and flexibility in the location and size of parking facilities. Primary platform access, featuring stairs and elevators, is to be located at the southern end of the platforms. Secondary access could be provided in the vicinity of Jenks Street, Cross Street, Central Street, and/or Pacific Street.

DCW proceeded to explain that the flexibility of the design allowed for several investment scenarios, as follows:

1. Base Case: commuter rail stop with primary platform access near Jenks Street

2. Base Case Plus: commuter rail stop with primary platform access near Clay Street and/or the historic station site; southern end of platform access near northern end of historic station building. The portion of platform south of Clay Street would not be used for boarding, due to the curvature and superelevation of the track in that location.
3. Full Build: commuter rail stop with primary platform access at the historic station building; southern end of platform access near northern end of historic station building. The portion of platform south of Clay Street would not be used for boarding, due to the curvature and superelevation of the track in that location. This option also includes reuse of the station, construction of a parking garage, and additional street-level retail.

DCW further explained that construction of the Base Case or Base Case Plus would not preclude the construction of Full Build amenities at a later date.

DCW introduced the capital costs and operations and maintenance costs for each investment scenario. The capital costs (including contingencies and add-ons in 2007 dollars) are estimated as follows: Base Case, \$24,450,000; Base Case Plus, \$31,800,000; and Full Build, \$67,800,000. The yearly operations and maintenance costs are estimated as follows: Base Case, \$80,000; Base Case Plus, \$80,000; and Full Build, \$1,420,000. Yearly revenues from parking and retail leases for each scenario are as follows: Base Case, \$60,000; Base Case Plus, \$60,000; and Full Build, \$1,100,000.

During the presentation of the concept design and capital costs, several questions were asked:

- Ike Seelbinder asked if the platforms would have railings. It was stated that the ends of the platforms would have railings, but that the boarding edge would not.
- Nancy Whit asked for clarification on the difference between the Base Case and Base Case Plus. It was stated that the usable (boarding) portion of the platform is located in the same place in both scenarios, but that the Base Case Plus includes platforms (walkway) south to connect to the historic station site, which is several hundred feet beyond the end of the usable platform.
- Ike Seelbinder and Maia Small asked how many parking spots would be included in each scenario. It was stated that the Full Build included 735 spaces in a 7-story garage structure. The cost of spanning the tracks is included in the garage cost estimate. The Base Case and Base Case Plus cost estimates include the capital cost of approximately 100 spots of surface parking.
- Steve Devine asked if elevator maintenance was included in the operations and maintenance cost of the Base Case and Base Case Plus. It was stated that it was not included in the current estimate but would be added to the final estimate.
- Nancy Whit asked what the parking fee was assumed to be. It was stated that the parking fee was assumed to be \$2 for surface parking and \$3 for garage parking, in line with current MBTA rates.
- Ike Seelbinder asked if land acquisition costs were included in the estimate. It was stated that the team would check to see if this cost had been included in the capital cost estimate.
- Nancy Whit asked if there would be elevators at all access points. It was stated that the primary access point, located at the southern end of the platform in all scenarios, would include elevators but that secondary access points would not.
- George Johnson asked if the distance from the primary access point to the usable platform would present an ADA compliance issue. It was stated that it was not expected to cause any issues.

Financial Analysis

Anne Galbraith then presented the results of the financial analysis. The team considered two scenarios: the Base Case and the Full Build. The funding scenario for the Base Case was assumed to be an 80/20 federal/state split and a 40/60 federal/state split was assumed for the Full Build. The Base Case financing scenario would add \$2,800,000 in financing costs while the Full Build funding scenario would add \$28,200,000 in financing costs.

AG explained that it was possible to develop a “middle ground” scenario for financing the project, where federal and state money would be used to fund the minimum build improvements to construct a commuter rail stop. This investment could then be used to attract private development to help construct other site features. She asked for questions and comments:

- Nancy Whit asked why the federally funded portion differed between the two scenarios. It was explained that competition for federal New Starts transit funding is intense and that Project Sponsors generally increase the state and local share on larger capital cost projects (like the Full Build) in order to make the project more attractive for federal funding. The Base Case could be constructed under Small Starts funding (for projects requesting less than \$25 million in federal funds) and secure a larger portion of federal funding. It was also noted that the Federal Transit Administration (FTA) requires a detailed financing plan to account for funding sources.

TOD Analysis

DCW introduced the expanded TOD analysis. The purpose of the analysis was to identify how to maximize the benefits of close proximity to transit while mitigating potential impacts to residents within ½ mile of the commuter rail stop. The team also strived to help the neighborhood understand TOD opportunities and impacts. The approach included two neighborhood meetings to discuss issues such as traffic and parking, multi-modal streets, housing, and employment.

DCW stated that the team held an open house meeting in the neighborhood, with information on traffic and parking, historic station reuse, commuter rail stop infrastructure, housing and neighborhood updates, safety and lighting issues, and TOD case studies. From the community input gained during the process, the team identified the following neighborhood priorities: maintaining affordability of housing, increasing economic development, improving the pedestrian environment, improving the driving environment, developing community amenities, and doing something with the historic building in the near future. He asked for questions and comments:

- Nancy Whit asked if the community voting on top concerns was available. It was stated that the votes had not yet been tabulated.

Implementation and Next Steps

DCW explained that the study is drawing to a conclusion, and that the final report will be completed by the end of June. A public meeting will be held on June 7, 2007 at 7:00pm. To advance the project, the next step is to discuss operations with railroad stakeholders in detail, in order to work out agreements concerning the development of a commuter rail stop on the line. After this is complete, the project can proceed to NEPA documentation, preliminary design, final design, and construction.

DCW stated that the team views the Base Case or Base Case Plus as the best way to jump-start the project and set into motion redevelopment of the historic station site. He then asked for general questions and comments:

- Ike Seelbinder asked for the cost of bringing the project to the point where it would be ready for construction. It was stated that, assuming \$30,000,000 capital cost, environmental review and permitting, preliminary design and final design could be expected to cost approximately

\$3,000,000. The timeline includes approximately 6 to 12 months for railroad negotiations (which could be concurrent with the front end of the NEPA work effort); 12-18 months for NEPA at a cost of about \$450,000; 12 months for preliminary engineering at a cost of about \$450,000; and 15-18 months for final design at a cost of about \$2,000,000.

- It was asked if the project could advance quickly enough to allow a bond issue to be on the November 2008 ballot. It was stated that it would depend on the level of risk the state was willing to accept, because costs would not be concrete at that time. Steve Devine stated that the process takes time, and that the project must be programmed into the Transportation Improvement Plan (TIP) beforehand.
- Ike Seelbinder and Nancy Whit inquired about the source of funding for permitting and design costs. It was stated that these funds generally come from state and federal sources.
- Ike Seelbinder noted that the Base Case and Base Case Plus are located entirely within Central Falls.
- Nancy Whit asked if the cost of additional tracks that might be required by Amtrak were included in the cost estimate. It was stated that it was not, and that the requirement of additional tracks would make the project prohibitively expensive.
- Maia Small asked if there were air rights or property issues. It was stated that the right-of-way is owned by Amtrak and that bridges are owned by the cities and state. Therefore, no private property issues are expected for the Base Case or Base Case Plus.
- Ike Seelbinder asked how long construction would take. It was stated that approximately two construction seasons would be needed.
- Nancy Whit asked if the state ballot issue for Warwick took place before the federal commitment to the project. Steve Devine stated that it was before federal commitment, but that the project has been programmed in the TIP.
- George Johnson noted that the holdup is the political process, not engineers, but that through perseverance, good projects do get built. It was noted that this project is expected to be viewed favorably by the FTA.
- Nancy Whit asked if the team considered moving the RIPTA bus depot to the station site. It was stated that at this point, only reorganization of routes to serve the station had been discussed.
- Ike Seelbinder asked if a larger traffic analysis would be required for the Environmental Assessment (EA – NEPA). It was stated that this current study was setup in anticipation of the NEPA process. The current study area is likely to be sufficient. Depending on how long it takes to get into the NEPA process, new counts may be required,
- Nancy Whit stated that if more bus routes were to serve the station, it might make sense to make it the bus terminal. It was noted that this would be an expansion of the scope conceived for the project.
- George Johnson asked if it was possible to determine how much revenue TOD development would generate. It was stated that in general, it is possible to determine how much revenue could be generated, and that it would depend on the type and density of development.
- Ike Seelbinder asked if the private sector would be involved in the development of the site. It was stated that Tax Increment Financing (TIF) was one example of how to involve the private sector. It was further noted that the Base Case and Base Case Plus would be expected to encourage private development.
- Ike Seelbinder noted that the Base Case Plus seemed to make sense for jump-starting the project.

- Steve Devine noted that the FTA encourages public/private partnerships.
- Bernard Cartier asked if trains would stop on Track 7. It was stated that trains would stop on the main line tracks. There is a possibility that a connection may be provided from Track 1 to Track 7 for use in a situation where a disabled train needs to be bypassed.
- Steve Devine noted that coordination with Amtrak was critical, as they own the right-of-way.
- Maia Small asked if Central Falls had been closely involved in the project. It was stated that Central Falls was represented on the project team by Art Hanson.

Attachments:

- Sign-In Sheet
- Agenda
- Printout of PowerPoint Slideshow

MD/md

xc: Attendees, File

Meeting Attendance Sheet

Please initial if in attendance and mark any changes or additions to the information provided.

| | | |
|---------------------------|--------------------------------|---|
| Date: May 29, 2007 | Time: 3:30 PM – 5:30 PM | Location: Visitor's Center, 2nd Fl., 175 Main Street, Pawtucket, RI 02860 |
|---------------------------|--------------------------------|---|

Stakeholder Committee

| Initials | Name | Organization | Address | Tel.No. | Email |
|------------|--|--|--|-----------------------|--|
| | Tom Moritz | Amtrak | 30th Street Station 2nd Floor South, Box 21 Philadelphia, PA 19104 | | moritzt@amtrak.com |
| <i>LM</i> | Leonard Elwin | Amtrak | 2 South Station, 5th Floor Boston, MA 02118 | 617-345-7501 | ElwinL@amtrak.com |
| <i>SLB</i> | Shandi Brown | Barton Street Neighborhood Association | c/o PCDC 210 West Avenue Pawtucket, RI 02860 | 401-726-1173 | shandibrown@pawtucketcdc.com |
| | Paul Redkovich | Blackstone Valley Community Action Program | 32 Goff Avenue Pawtucket, RI 02860 | 401-723-4520 | predkovich@yahoo.com |
| | President Jason R. Ledger, Jr. | Central Falls City Council | 21 Temple Place Central Falls, RI 02863 | | |
| | Mayor Charles Moreau | City of Central Falls | 53 River Street Central Falls, RI 02863 | | |
| | Joseph G. Nield, Director | City of Central Falls Department of Public Works | 53 River Street Central Falls, RI 02863 | 401-727-7466 | neoj@centralfallsri.us |
| | Mayor James Doyle <i>Ed. Reference.</i> | City of Pawtucket | | | |
| | Tom Cahir | Executive Office of Transportation | 10 Park Plaza, Suite 3170 Boston, MA 02116 | | |
| | Bob Billington | Blackstone Valley Tourism Council | 125 Main St Pawtucket, RI 02860 | | bvri@aol.com |
| | Garfield Spencer | First National Development | 2490 Black Rock Tnpk PMB 333 Fairfield, CT 06825 | | |
| | Richard Goldstein | Government Affairs, City of Pawtucket | 137 Roosevelt Avenue Pawtucket RI 02860 | 401-728-0500 x-358 | rgoldstein@pawtucketri.com |
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| | Tom Moses | Moses Afonso Jackvony | 170 Westminster Street Suite 201 Providence, RI 02903 | 401-453-3600 | tmoses@moses&afonso.com |
| | Paul L. Ouellette | Northern Rhode Island Chamber of Commerce– Central Falls Advisory Group and Pawtucket Advisory Group | 6 Blackstone Valley Place Suite 301 Lincoln, RI 02865 | 401-334-1000 ext. 117 | pouellette@nrichamber.com |
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| <i>NW</i> | Nancy Whit | Pawtucket Citizens Development Corporation | 210 West Avenue Pawtucket RI 02860 | 401-726-1173 | nancywhit@pawtucketcdc.com |
| | Joseph Palmer | Preservation Society of Pawtucket | 67 Park Place Pawtucket RI 02860 | 401-725-9581 | pawtucket.preservation@verizon.net |
| | Paul Mowrey | Preservation Society of Pawtucket | 67 Park Place Pawtucket RI 02860 | 401-725-9581 | pawtucket.preservation@verizon.net |
| | Marianela Dougal, Deputy Director | Progreso Latino | 626 Broad Street Central Falls, RI 02863 | 401-728-5920 | |
| <i>BAC</i> | Bernard Cartier | Providence and Worcester Railroad | 75 Hammond Street Worcester, MA 01610 | 508-459-4545 | bernie@pwrr.com |
| <i>SD</i> | Steve Devine | Rhode Island Department of Transportation | 2 Capital Hill, Room 372 Providence, RI 02903-1190 | 401-222-4203 | sdevine@dot.state.ri.us |
| | Mark Therrien | RIPTA | 265 Melrose Street Providence, RI 02907 | 401-784-9500 x-452 | mtherrien@ripta.com |

City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis
Meeting Attendance Sheet
Please initial if in attendance and mark any changes or additions to the information provided.

Date: May 29, 2007

Time: 3:30 PM – 5:30 PM

Location: Visitor's Center, 2nd Fl.,
175 Main Street, Pawtucket, RI 02860

Stakeholder Committee

| | | | | | |
|--|-------------------|---|--|--------------|--|
| | Ike Seelbinder | SMPO Properties, Inc. | 5858 Ridgeway Center Parkway Memphis, TN 38120 | 901-327-7676 | |
| | Elaine A. Coderre | State Representative - City of Pawtucket | 18 Angle Street Pawtucket RI 02860 | 401-726-1190 | |
| | Joseph L. Faria | State Representatives City of Central Falls | 112 Clay Street Central Falls, RI 02863 | | |
| | | | | | |

Project Team:

| | | | | | |
|--|----------------------------|---|---|--------------|--|
| | Mike Cassidy | City of Pawtucket, Department of Planning and Redevelopment | 175 Main Street Pawtucket, RI 02860 | 401-724-5200 | cassidy@psdri.net |
| | Richard Davis | Pawtucket Foundation | PO Box 515 Pawtucket, RI 02860 | 401-725-4400 | rcd@pawtucketfoundation.org |
| | Arthur Hanson | City of Central Falls | 580 Broad Street Central Falls, RI 02863 | 401-727-7480 | alhanson@centralfallsri.us |
| | Barney Heath | City of Pawtucket, Department of Planning and Redevelopment | 175 Main Street Pawtucket, RI 02860 | 401-724-5200 | heathb@psdri.net |
| | Susan Mara | City of Pawtucket, Department of Planning and Redevelopment | 175 Main Street Pawtucket, RI 02860 | 401-724-5200 | maras@psdri.net |
| | Kristine Wickham Zimmerman | VHB | 99 High Street, 10th Fl Boston, MA 02110 | 617-728-7777 | kwickham@vhb.com |
| | Matt Dixon | VHB | 99 High Street, 10th Fl Boston, MA 02110 | 617-728-7777 | mdixon@vhb.com |
| | David Wilcock | VHB | 99 High Street, 10th Fl Boston, MA 02110 | 617-728-7777 | dwilcock@vhb.com |

Others:

[illegible]

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility
Study and Site Analysis**

Stakeholder Committee Meeting No. 04

**May 29, 2007
3:30 – 5:30 PM**

- 1. Overall Project Status**
- 2. Development of Concept Design for Preferred Site**
- 3. Financial Analysis**
- 4. Expanded Transit-Oriented Development Analysis**
- 5. Planning for Implementation**
- 6. Next Steps**



Pawtucket/Central Falls Commuter Rail Facility – Stakeholder Committee Meeting #4

May 29, 2007

Hammar Hangen Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Project Agenda

- Overall Project Status
- Development of Concept Design for Preferred Site
- Financial Analysis
- Expanded Transit-Oriented Development Analysis
- Planning for Implementation
- Next Steps

Hammar Hangen Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Project Status to Date

- Phase II Analysis Completed in January 2007
- Evaluation and Conceptual Design for Preferred Site Option
- Financial Analysis and Planning for Implementation
- Neighborhood Workshops and TOD Analysis

Hammar Hangen Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Concept Design – Preferred Site

Platforms to be located between Clay Street and Pacific Street



Hammar Hangen Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Concept Design – Preferred Site

- Two 800 foot long high level platforms
- ADA compliant access between the street and the platforms
- Canopy, lighting
- Electronic signs
- Other amenities



Hammar Hangen Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Concept Design – Preferred Site



Hammar Hangen Associates, Inc.

Concept Design – Features

- Primary access at south end of platforms
- Flexible access points:
 - Vicinity of Clay Street/Jenks Street
 - Jenks Street or Cross Street
 - Central Street or Pacific Street
- Flexible parking locations
 - Opportunity for smaller surface lots

Investment Scenarios

- Base Case: Stop w/access in Jenks St area
- Base Case Plus: Stop w/access from Clay St./historic station area
- Full Build: Stop, reuse of station, garage, retail

Capital Costs: Base Case

| | |
|--|------------------------|
| Platforms | \$2.0 million |
| Platform Access (3 Locations) | \$2.8 |
| Bridge Modifications and Retaining Walls | \$6.5 |
| Railroad Modifications | \$3.0 |
| Other | \$2.0 |
| SUB-TOTAL | \$16.3 million |
| Concept Contingencies and Add-Ons | \$8.15 |
| TOTAL | \$24.45 million |

Capital Costs: Base Case Plus

| | |
|--|-----------------------|
| Platforms (Includes 500' Access Walks) | \$3.2 million |
| Platform Access (3 Locations) | \$2.8 |
| Bridge Modifications and Retaining Walls | \$9.7 |
| Railroad Modifications | \$3.5 |
| Other | \$2.0 |
| SUB-TOTAL | \$21.2 million |
| Concept Contingencies and Add-Ons | \$10.6 |
| TOTAL | \$31.8 million |

Concept Design – Garage and Retail Option



Capital Costs: Full Build

| | |
|-----------------------------------|-----------------------|
| Renovate Building | \$6.8 million |
| Parking Garage | \$17.0 |
| Other | \$1.0 |
| SUB-TOTAL | \$24.8 million |
| Concept Contingencies and Add-Ons | \$12.4 |
| TOTAL | \$37.2 million |
| Capital Costs: Option 2 | \$30.6 |
| TOTAL | \$67.8 million |

Operating Costs and Revenues: Base Case and Base Case Plus

| | |
|----------------------|-------------------------|
| Platform Maintenance | \$0.04 million |
| Facilities O&M | \$0.0 |
| Parking O&M | \$0.04 |
| TOTAL | \$0.08 million |
| Parking Revenues | \$0.06 |
| Lease Revenues | \$0.0 |
| TOTAL | \$0.06 |
| NET | (\$0.02) million |

Operating Costs and Revenues: Full Build

| | |
|----------------------|-------------------------|
| Platform Maintenance | \$0.04 million |
| Facilities O&M | \$0.43 |
| Parking O&M | \$0.95 |
| TOTAL | \$1.42 million |
| Parking Revenues | \$0.57 |
| Lease Revenues | \$0.53 |
| TOTAL | \$1.10 |
| NET | (\$0.32) million |

Capital Funding Strategies

| | |
|--------------------------|-----------------------|
| Base Case: | |
| Federal Sources | \$17.5 million (80%) |
| State/Local Sources | \$4.4 (20%) |
| Financing/Interest Costs | \$2.8 |
| TOTAL | \$24.7 million |
| Full Build: | |
| Federal Sources | \$27.7 million (40%) |
| State/Local Sources | \$40.4 (60%) |
| Financing/Interest Costs | \$28.2 |
| TOTAL | \$97.5 million |

Expanded TOD Analysis

Purpose:

Identify how to maximize the benefits of close proximity to transit while mitigating potential impacts to residents within ½ mile of the commuter rail stop.

Expanded TOD Analysis

Approach:

- Neighborhood meetings
- Traffic and Parking
- Multi-modal Streets
- Housing and Employment

Expanded TOD Analysis

Neighborhood Priorities:

- Housing Affordability
- Economic Development
- Pedestrian Environment
- Driving Environment
- Community Amenities
- Historic Station Building
- Other

Expanded TOD Analysis

Open House:

- Traffic and Parking
- Old Train Station Reuse
- Commuter Rail Stop
- Housing and Neighborhood Update
- Safety/Lighting
- TOD Case Studies

Planning for Implementation

- Discussions with railroad stakeholders
- Environmental Review (NEPA Process)
- Preliminary Design
- Final Design
- Construction

Next Steps

- Complete Expanded TOD Analysis
- Complete Conceptual Design of Commuter Rail Stop
- Complete Financial Analysis
- Public Meeting June 7, 2007 @ 7 PM
- Final Report by June 30, 2007



Pawtucket/Central Falls Commuter Rail Facility – Stakeholder Committee Meeting #4

May 29, 2007



Vanasse Hangen Brustlin, Inc.

38 Chauncy Street, Suite 200

Boston, Massachusetts 02111

617 728-7777

FAX 617 728-7782

Meeting Notes

Attendees: See Attached Sign-In

Date/Time: 2/23/06

Project No.: 09736.00

Place: 175 Main Street,
Pawtucket, RI

Re: Pawtucket/Central Falls Feasibility Study

Notes taken by: K. Wickham Zimmerman

On February 23, 2006, a meeting was held with representatives from the Project Team, the Cities of Pawtucket and Central Falls, the Pawtucket Foundation and the Rhode Island Department of Transportation (RIDOT). The purpose of this meeting was to provide an overview of the study and to obtain feedback from RIDOT on the project. The following summarizes highlights from this discussion:

- Mike McArdle, VHB, provided an overview of the scope of services of the study. He explained that the Project Team is currently focused on the first task, which is to study the feasibility of stopping trains at the station.
- Steve Devine, RIDOT, discussed the coordination that has occurred with the MBTA in recent years. It was also noted that the City of Pawtucket had a meeting with the MBTA over the summer. When the initial study was conducted by KKO, the MBTA's primary concerns were on parking availability (i.e. making sure that there is enough parking at a Pawtucket/Central Falls Station) and on the impact to service (i.e. on the existing MBTA schedule). The MBTA had stated that any impact on the schedule should occur on the Rhode Island end of the line. RIDOT can request times for service, but they can only add on to existing service and cannot change schedule times out of South Station or at stops in Massachusetts. RIDOT and the MBTA both acknowledge that any requests for service changes will be negotiated as part of the next phase of the Pilgrim Partnership.
- Additionally, it was noted the MBTA does not want to bear any costs as a result of service to the Pawtucket/Central Falls Station. The MBTA, at a minimum, wants to break even on the operational costs.
- The Pawtucket layover facility is not operational yet. It is intended to open this summer. The project is done, however the cutover connection from Amtrak still needs to be completed. It was explained that the trains going to the layover facility will stop at all stations including Attleboro, South Attleboro, and Providence.
- It was stated that the Project Team would be scheduling a meeting with the MBTA. RIDOT does not want to be involved in either the MBTA discussions or with Amtrak. Rather, RIDOT would like to be involved in the technical meetings and on the Stakeholders Committee. RIDOT will meet with the MBTA when the Pilgrim partnership needs to be renegotiated.

- Steve Devine explained that RIDOT previously did a license plate survey and learned that South Attleboro is overcrowded, with 90% of the cars coming from Rhode Island. The survey stated that 35% at those who park at Attleboro Station are from Rhode Island. Steve Devine will check to see if the license plate survey study is available. It was noted that at South Attleboro, most of the parking occurs at the shopping plaza and that the MBTA owns only a small portion of the parking.
- It was explained that for this study, the ridership from the KKO study and the South County study will be updated. It was discussed that 50% of the people who live in the Barton Street and Downtown areas are without a car and rely in transit. Information from RIPTA will be useful for this study.
- Steve Devine asked if reverse trips will be evaluated. Mike McArdle stated that reverse trips to Providence, URI and TF Green will also be evaluated.
- It was noted that Amtrak's policy currently is not to allow stopping on the main line tracks (Tracks 1 and 2). Amtrak prefers siding tracks at stations on the Northeast Corridor, and any new stations will need an additional track. This was an issue for RIDOT at Warwick Station. It was suggested that Tom Moritz at Amtrak be contacted to schedule a meeting.
- Discussions about the Stakeholder Committee were conducted. It was explained that representatives from organizations will be invited to be on the committee. It was stated that the developer and the housing authority will also be invited to participate. Meetings with the property owner will be held separately. Steve Devine suggested that RIDOT's invitation for the Stakeholder Committee be sent to Director Capaldi and having Mr. Devine be copied on it.
- It was stated that the Stakeholder Committee meeting will be held after the Project Team has met with the MBTA and with Amtrak and determined if service to the station is feasible.
- It was requested that the Project Team attend a Central Falls City Council meeting to tell them about the project. The City will send a letter to the City Council requesting to be added to the agenda of an upcoming meeting.
- It was explained that flyers will be sent to business associations and to organizations in advance of the public meetings. Notices will be made in both Spanish and English.
- It was suggested that, in addition to meeting with Amtrak and the MBTA, the Project Team meet with the Providence and Worcester (P&W) railroad because they own the rail yard. The City stated that the P&W will be invited to participate in the Stakeholder Committee, but that they would call Scott Conte, the President of P&W, prior to them receiving the Stakeholder Committee invitation.
- The City provided a CD to the Project Team with plans of the original station. It was noted that the CD does not contain all of the plans, but contains all that were available from the Judicial Records Center. It was recommended that the City search the UCONN Archives to see if additional information is available.

Attachments

Cc: S. Mara
M. Cassidy
File

Meeting Attendance Sheet

| | | | |
|--------------------------------|----------------------------------|---|----------------|
| Date: February 23, 2006 | Time: 10:00 AM – 11:30 AM | Location: Department of Planning & Redevelopment, 175 Main Street, Pawtucket | Page: 1 |
|--------------------------------|----------------------------------|---|----------------|

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Meeting Notes

Attendees: See Attached List

Date/Time: March 13, 2006; 1:00 PM

Project No.: 09736.00

Place: Massachusetts Bay
Transportation Authority, 10
Park Plaza, Room 5750,
Boston, MA

Re: Pawtucket/Central Falls Commuter Rail
Facility Feasibility Study and Site Analysis

Notes taken by: K. Wickham-Zimmerman\D. Wilcock

The purpose of the meeting was to provide representatives of the Massachusetts Bay Transportation Authority (MBTA) with an overview of the project scope of services and schedule and to discuss the feasibility of restoring train service to Pawtucket/Central Falls. A copy of the agenda is attached for reference.

Overview of Scope and Schedule

David Wilcock provided an overview of the project's scope of services and schedule. He discussed the three step approach to the study, which is designed to answer three questions: 1) Is commuter rail service to Pawtucket/Central Falls feasible?, 2) If service is feasible, which of the two sites identified is the better location for a station?, and 3) What could the station layout look like at the preferred site?.

David provided a brief description of the two sites under consideration: 1) the historic depot location; and 2) the Providence & Worcester Railroad's rail yard located about ½ mile west of the historic depot location. Parking will be provided at either site; the quantity of spaces will be based on the forecasts. The most likely scenarios are a deck/garage at the historic location and surface parking at the yard site. Earlier studies had suggested the need for up to 500 spaces.

Dennis DiZoglio asked what group is leading the project. David indicated that this is a City of Pawtucket-led effort. The study is being managed by the City's Department of Planning and Redevelopment. Michael Cassidy, Director, is the lead agency contact. The City and VHB met with Steve Devine, Rhode Island Department of Transportation (RIDOT), on February 23rd to coordinate RIDOT's role in the study.

Both Dennis and Jody Ray mentioned that any request to introduce a stop at Pawtucket/Central Falls will need to be initiated by RIDOT and would become part of the agreement between the MBTA and the state.

Dennis asked how ridership would be addressed. It was asked if the study would rely on the forecasts prepared by KKO & Associates a few years ago. David indicated that the KKO work will provide one of the inputs for the current effort. Updated forecasts will be provided that look at both a Boston-based market and a Providence south based market.

Discussion of Train Service Feasibility

The meeting focused on identifying the issues that from the MBTA's perspective will need to be considered as part of the feasibility analysis. The following summarizes the key points of discussion:

1. RIDOT and the MBTA do not currently have an agreement for commuter rail service south of Providence. The MBTA and RIDOT have been discussing the service and the MBTA is aware of RIDOT's goals for the service. A formal agreement has not been finalized.
2. The new Pawtucket Layover facility is designed to feed trains directly into Providence Station. All the power switches are on the west (Providence) end of the facility. A single hand throw turnout is located on the east end for emergency entry/escape only.
3. Once the new Pawtucket Layover facility is opened (June 2006 is the anticipated date), the agreement with RIDOT is that any train originating or terminating at the layover facility will provide revenue service to Providence. Trains originating in Boston that currently turn at South Attleboro will continue to turn at South Attleboro. The trains laying over in Pawtucket will, as part of the agreement, serve Providence Station adding a couple of weekday trains and providing weekend service.
4. Jody Ray mentioned that some of the turn times at South Attleboro are long enough that the trip could be extended to Providence with little or no impact on the schedule. A stop at Pawtucket/Central Falls would likely add approximately 4 to 5 minutes to the roundtrip schedule (2 to 2.5 minutes in each direction). Jody did not think that the current turn times at South Attleboro would provide enough time to absorb a Pawtucket/Central Falls stop without further schedule adjustments. Jody stated that any adjustments to the schedule would have to be made to impact the Rhode Island end of the service. South Station slots and stop times in Massachusetts will need to be maintained.
5. Jody noted that the MBTA has recently conducted a study of train turn times. The current standard for turning a train is 10 minutes, which the MBTA feels is quite tight. The 10 minutes does not allow any schedule recovery time. The MBTA is looking at lengthening the turn times to 15 or 20 minutes. This change will need to be considered when looking at adding a stop at Pawtucket. Jody suggested that VHB contact Tom Foster of the MBTA for a copy of the train turn time study.
6. Dennis and Jody commented that the service south of Providence works out well for both RIDOT and the MBTA in that a single seat can be sold twice. For example, 40 percent of the Wickford Station boardings are projected to get off at Providence. The Pawtucket stop, however, will add riders and take existing seats from Massachusetts riders. Both Dennis and Jody emphasized that new seats will have to be provided for new riders. The peak period trains from Providence are at or near capacity today. Coaches will need to be added to trains to accommodate any new riders.
7. The existing Providence service is designed to serve the Boston market. If "reverse" commuting service is desired (Pawtucket to Providence and south), the cost of crews will need to be considered. Service would need to be added to provide service to Providence and south as a "reverse" commute trip. These issues should be considered when examining ridership.
8. The study will need to consider both the capital (equipment and railroad infrastructure) and operating costs of the service change. The MBTA needs to, at a minimum, break even on the operating costs of the service changes. The MBTA will not agree to operate at a loss.
9. The location of the platforms for both potential station sites was discussed. Jody noted that Amtrak's new policy is that commuter rail trains will not be allowed to stop on the main line tracks (Track 1 and 2 in Pawtucket). This would mean that all the trains in both directions would need to stop on the "FRIP" track (westerly-most track under the station). To accommodate this requirement, signal and track changes would be required at Boston Switch (P&W main line junction just east of the station). Jody commented that RIDOT will be building a station siding at T.F. Green Airport to accommodate this Amtrak requirement.

10. Traditionally, RIDOT has used capital funds to “purchase” service from Massachusetts. In the future, both capital and operating funds will be needed to support the service. The MBTA will not accept the purchase of coaches in lieu of operating costs.
11. Dennis and Jody suggested that the Executive Office of Transportation (EOT) be made aware of the project. They suggested that the City contact Tom Cahir at EOT to coordinate the study efforts.

Summary of Key MBTA Considerations

The key considerations from the MBTA’s perspective are:

- Both capital and operating costs of the service must be covered.
- Sufficient seats must be provided for all new riders.
- There must be sufficient time in the schedule to allow for the longer turn times and some recovery time.

Summary/Next Steps

Dennis and Jody would like to be kept informed but do not want to be part of the Stakeholder’s Committee. They encouraged the Study Team to contact EOT for their involvement in this project.

VHB will contact Tom Foster for all the necessary Attleboro Line scheduling and operating information.

Attachments

DCW/dw

xc: Attendees
Susan Mara, City of Pawtucket
File

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility
Study and Site Analysis**

**Stakeholder Coordination Meeting No. 02
With the Massachusetts Bay Transportation Authority**

**10 Park Plaza, Room 5750
Boston, MA 02115**

**March 13, 2006
1:00 PM - 2:30 AM**

- 1. Overview of Project Scope of Services and Schedule**
 - **Phase I: Train Service Feasibility**
 - **Phase II: Analysis and Comparison of Two Sites**
 - **Phase III: Evaluation and Site Design for the Preferred Commuter Rail Station Site Option**
- 2. Discussion of Phase I: Train Service Feasibility**
 - **Pilgrim Partnership**
 - **MBTA Operations w/new Pawtucket Layover Facility**
- 3. Railroad Contacts/Coordination Meetings**
 - **MBTA**
 - **Amtrak**
 - **Providence & Worcester Railroad**
- 4. Schedule/Coordination/Next Steps**
 - **Stakeholder Committee**
 - **Individual Stakeholder Meetings**
 - **Public Meetings**

Meeting Attendance Sheet

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Meeting Notes

Attendees: Mike DeCataldo, Amtrak
Drew Galloway, Amtrak
Tom Moritz, Amtrak
Kristine Wickham-
Zimmerman, VHB
David Wilcock, VHB

Date/Time: March 16, 2006; 10 AM

Project No.: 09736.00

Place: Conference Call

Re: Pawtucket/Central Falls Commuter Rail
Facility Feasibility Study and Site Analysis

Notes taken by: K. Wickham-Zimmerman/D. Wilcock

The purpose of the conference call was to provide representatives of the National Railroad Passenger Corporation (Amtrak) with an overview of the project scope of services and schedule and to discuss the feasibility of restoring train service to Pawtucket/Central Falls. A copy of the agenda is attached for reference.

Overview of Scope and Schedule

Kristine Wickham-Zimmerman provided a brief introduction to the Project. She discussed the public involvement process and the Stakeholders Group that the City plans to form.

David Wilcock provided an overview of the project's scope of services and schedule. He discussed the three-step approach to the study, which is designed to answer three questions: 1) Is commuter rail service to Pawtucket/Central Falls feasible?; 2) If service is feasible, which of the two sites identified is the better location for a station?; and 3) What could the station layout look like at the preferred site?.

David indicated that this is a City of Pawtucket-led effort. The study is being managed by the City's Department of Planning and Redevelopment. Michael Cassidy, Director, is the lead agency contact for the study. It was explained that the City and VHB met with Steve Devine, Rhode Island Department of Transportation (RIDOT), on February 23rd to coordinate RIDOT's role in the study. VHB also met on Monday, March 13th with Dennis DiZoglio and Jody Ray of the Massachusetts Bay Transportation Authority (MBTA) to discuss their issues and concerns regarding the feasibility of stopping trains at a Pawtucket/Central Falls Station.

David provided a brief description of the two sites under consideration: 1) the historic depot location; and 2) the Providence & Worcester Railroad's rail yard located about ½ mile west of the historic depot location.

The Project is scheduled to take approximately one year to complete. The scheduled completion date is January 2007. The Phase 1 analysis that examines the feasibility of restoring train service to a Pawtucket/Central Falls Station is scheduled to be complete by mid to late June 2006. The other two phases will follow in roughly four month timeframes provided that the Phase 1 finds the service to be feasible.

Discussion of Train Service Feasibility

The meeting focused on identifying the issues that from Amtrak's perspective will need to be considered as part of the operational feasibility analysis. The following summarizes the key points of discussion:

1. The forthcoming revised ADA guidelines were discussed. The question of how the historic station would be adapted to meet the new guidelines was questioned. In particular, the level boarding requirement was cited as an area of note.
2. Capacity is the number one issue for Amtrak. More stations/more stops mean overall slower speeds for commuter trains, resulting in increased speed differentials between the commuter and high-speed trains.
3. Amtrak's current guidance is that all new commuter rail stations will be required to have station sidings. Commuter rail trains will not be allowed to stop on the main line tracks. The example of the station at T.F. Green Airport in Warwick was cited as the most recent example of where this policy was applied.
4. The existing track alignment/structure was questioned. David Wilcock noted that the existing alignment includes three tracks: Main Line Track 2 is against the south wall of the cut, Main Line Track 1 is in the center, and Track 7 (the FRIP Track) is against the north wall of the cut. David commented that historically this was a four track right of way, with two main line tracks in the center and two outside station tracks. The Northeast Corridor Improvement Project (NECIP) created the current track configuration in the area. It was noted that new high speed design criteria require greater lateral clearances that likely necessitated the current main line track configuration. Therefore, it is unlikely the historic track configuration could be restored.
5. Track speeds in the area were discussed. David commented that track speeds are reduced through the historic station area due the horizontal track geometry. Mike DeCataldo said that the track speeds are 60 MPH for Class A and 50 MPH for Class B equipment.
6. The use of Track 7 for commuter rail trains was discussed. It was noted that there are no crossovers between Tracks 7 and 1 and 1 and 2 at Boston Switch. These crossovers would be needed in order to utilize Track 7 for both inbound and outbound commuter rail trains. David commented that there is little tangent track just east of the station to accommodate the crossovers. This will need to be examined more closely using "As-Builts" of the Northeast Corridor.
7. This is a sensitive area along the corridor. A site specific capacity analysis would need to be conducted to evaluate the impacts of stopping commuter rail trains at a Pawtucket/Central Falls Station. A separate analysis will be needed for both potential stops. The analysis will need to include Amtrak, MBTA, P&W, and CSX trains. David commented that the P&W Yard site is located on a break between signal blocks.
8. The basis for the analysis was discussed. Amtrak indicated that this should be based on the level of train service documented in the Record of Decision for NECIP. This was the case that RIDOT agreed to follow for the analysis of service south of Providence.
9. Should the project advance beyond the study stage, Amtrak requires the following:
 - An agreement that compensates them for their services during design and construction
 - Insurance/indemnification
 - Protection of Amtrak service during construction
10. David commented that coordination is already underway with Amtrak with a Right-of-Entry Agreement for survey and study work efforts.

Coordination

Tom Moritz will be the point of contact for Amtrak.

David requested access to the As-Built electrification, track, and signal plans for the station area as well as a sufficient length of the corridor to support the capacity analysis. Tom will check on the availability of the plan information.

Amtrak would like to be a part of the Stakeholders Group and would like to be apprised of stakeholder and public meetings.

Summary/Next Steps

VHB plans to meet with representatives of the P&W shortly. This meeting will complete the initial round of "one-on-one" meetings with key stakeholders (Amtrak, MBTA, RIDOT, and P&W).

VHB will notify Amtrak of upcoming project meetings.

Attachments

DCW/dw

xc: Attendees
Susan Mara, City of Pawtucket
File

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility
Study and Site Analysis**

**Stakeholder Coordination Meeting No. 03
With the National Railroad Passenger Corporation (Amtrak)**

**Via Tele-Conference
1-877-539-0724
Conference Code: 6431381733**

**March 16, 2006
10:00 AM - 11:00 AM**

- 1. Overview of Project Scope of Services and Schedule**
 - Phase I: Train Service Feasibility
 - Phase II: Analysis and Comparison of Two Sites
 - Phase III: Evaluation and Site Design for the Preferred Commuter Rail Station Site Option
- 2. Discussion of Phase I: Train Service Feasibility**
 - General Requirements of a Commuter Rail Station
 - Station Stop at historic location
 - Station Stop at P&W Yard
- 3. Railroad Contacts/Coordination Meetings**
 - MBTA
 - Amtrak
 - Providence & Worcester Railroad
- 4. Schedule/Coordination/Next Steps**
 - Stakeholder Committee
 - Individual Stakeholder Meetings
 - Public Meetings



Meeting Notes

Attendees: Bernard Cartier, PWRR
David Fitzgerald, PWRR
Kristine Wickham-
Zimmerman, VHB
David Wilcock, VHB

Date/Time: April 25, 2006; 8:30 AM

Project No.: 09736.00

Place: Providence and Worcester
Railroad Office
75 Hammond Street
Worcester, MA

Re: Pawtucket/Central Falls Commuter Rail
Facility Feasibility Study and Site Analysis

Notes taken by: K. Wickham-Zimmerman/D. Wilcock

The purpose of the meeting was to provide representatives of the Providence and Worcester Railroad (PWRR) with an overview of the project scope of services and schedule and to discuss the feasibility of restoring train service to Pawtucket/Central Falls. A copy of the agenda is attached for reference.

Overview of Scope and Schedule

David Wilcock provided an overview of the project's scope of services and schedule. He discussed the three-step approach to the study, which is designed to answer three questions: 1) Is commuter rail service to Pawtucket/Central Falls feasible?; 2) If service is feasible, which of the two sites identified is the better location for a station?; and 3) What could the station layout look like at the preferred site?.

David indicated that this is a City of Pawtucket-led effort. The study is being managed by the City's Department of Planning and Redevelopment. Michael Cassidy, Director, is the lead agency contact for the study.

Today's meeting is the fourth with key project stakeholders. A brief summary of the three previous meetings was provided by David. Copies of the notes from each of the meetings were provided to the PWRR representatives:

- Rhode Island Department of Transportation (RIDOT), February 23, 2006: The City and VHB met with Steve Devine (RIDOT) to coordinate the state's role in the study.
- Massachusetts Bay Transportation Authority (MBTA), March 13, 2006: VHB met with Dennis DiZoglio and Jody Ray to discuss their issues and concerns regarding the feasibility of stopping trains at a Pawtucket/Central Falls Station. The MBTA's primary concerns were: 1) impact on their existing schedule, 2) train loads (crowding), and 3) the need to stop on the main line tracks. The MBTA would have significant concerns if they were asked to run the entire commuter rail service schedule (both directions) on the FRIP track between Providence and Pawtucket/Central Falls.

- National Railroad Passenger Corporation (Amtrak), March 15, 2006: VHB conducted a teleconference with Drew Galloway, Tom Moritz, and Mike DeCataldo to discuss their issues and concerns regarding the feasibility of stopping trains at a Pawtucket/Central Falls Station. Amtrak's primary concerns are 1) that they do not want any trains stopping on the main line tracks and 2) that their schedule not be impacted.

David provided a brief description of the two sites under consideration: 1) the historic depot location; and 2) the Providence & Worcester Railroad's rail yard located about ½ mile west of the historic depot location.

The Project is scheduled to take approximately one year to complete. The scheduled completion date is January 2007. The Phase 1 analysis that examines the feasibility of restoring train service to a Pawtucket/Central Falls Station is scheduled to be complete by mid to late June 2006. The other two phases will follow in roughly four month timeframes provided that the Phase 1 finds the service to be feasible.

Overview of Potential Options to Address Prior Concerns Raised

Based on the meetings held with the MBTA and Amtrak, the two key points that have emerged are:

1. Amtrak does not want any trains stopping on the main line tracks.
2. The MBTA does not want to be moved off of the main line tracks to the FRIP track.

David indicated that one potential option being developed for consideration is using the FRIP track for outbound (Providence bound) trains during the afternoon peak period. All other outbound trains could continue to stop on the main line (Track 1) unless there was a potential schedule impact on Amtrak service. The inbound (Boston bound) trains would stop on the main line (Track 2). This option addresses the critical PM peak period issue where the MBTA and Amtrak westbound service is tightly scheduled. In the morning peak, Amtrak has little eastbound service competing with the MBTA for track time.

To accomplish this connection, two new crossovers would need to be installed. One crossover would be installed just west of Boston Switch connecting Track 1 with the FRIP track. The second crossover would be installed just east of Providence Station connecting the FRIP to the station platform tracks. Both crossovers would use No. 20 turnouts (45 mph MAS).

Discussion of Train Service Feasibility

The meeting focused on identifying the issues that from PWRR's perspective will need to be considered as part of the operational feasibility analysis. The following summarizes the key points of discussion:

Use of FRIP Track

1. Capacity is the number one issue for PWRR.
2. Two locals currently operate along the FRIP: PR2 and PR3. The time slots are determined by Amtrak operations
3. Business has been increasing along the Providence waterfront and in Cranston.
4. The two locals are currently handling about 60 cars (20,000 tons). This traffic could soon double.
5. Once the FRIP connection at Davisville is made, train traffic will increase substantially.
6. PWRR has done an assessment of FRIP track operations south of Providence with the eight commuter rail trips proposed by RIDOT for the South County service.
7. The FRIP will be signalized in the future; all turnouts are currently hand throws.
8. PWRR has overhead rights on the Northeast Corridor east of Boston Switch to Attleboro (Attleboro Secondary). The rights are for access to the Newport Secondary (via Fall River).
9. If the FRIP is used for commuter service, platform clearances will be an issue.

Use of PWRR Yard for Station Site

1. PWRR has two active customers in the yard with a third expected to start soon.
2. The yard has an efficient six track layout.
3. The yard is an important source of revenue for the railroad.
4. PWRR's long term plan includes continued use of the yard in a manner similar to the current operation.
5. It was also noted that the lead track for the yard also serves as the tail track out of Providence due to vertical clearance restrictions.
6. PWRR would be open to discussing the use of the yard for a commuter rail station if a comparable nearby site could be located and secured for the relocation of the yard operations.

Coordination

David requested a copy of the assessment of FRIP track operations. David Fitzgerald will provide a copy.

Summary/Next Steps

This meeting completes the initial round of "one-on-one" meetings with key stakeholders (Amtrak, MBTA, RIDOT, and P&W). The next step will be for VHB to review the input received with the City.

Attachments

DCW/dw

xc: Attendees
Susan Mara, City of Pawtucket
File

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Meeting Notes

Attendees: Mike Cassidy, City of
Pawtucket
Barney Heath, City of
Pawtucket
Sue Mara, City of Pawtucket
Rich Davis, Pawtucket
Foundation
Steve Devine, RIDOT
Jody Ray, MBTA
Bernard Cartier, PWRR
Mike DeCataldo, Amtrak
Tom Moritz - Amtrak
Terry Byrne - URS
Mike McArdle, VHB
David Wilcock, VHB
Kristine Wickham
Zimmerman, VHB

Date/Time: 6/5/06; 1:00 PM

Project No.: 09736.00

Place: VHB's Boston Office

Re: Pawtucket/Central Falls Commuter Rail
Facility Feasibility Study and Site Analysis:
Stakeholder Coordination Meeting No. 05

Notes taken by: K. Wickham Zimmerman

The purpose of the meeting was to provide representatives of the Rhode Island Department of Transportation (RIDOT), Amtrak, Massachusetts Bay Transportation Authority (MBTA), and the Providence and Worcester Railroad (PWRR) with an update of the project scope of services and schedule and to discuss the initial operational issues identified regarding the feasibility of restoring train service to Pawtucket/Central Falls. A copy of the agenda is attached for reference.

Update of Project Scope of Services and Schedule

David Wilcock provided an update of the project's scope of services and schedule. He briefly reviewed the three-step approach to the study, which is designed to answer three questions: 1) Is commuter rail service to Pawtucket/Central Falls feasible?; 2) If service is feasible, which of the two sites identified is the better location for a station?; and 3) What could the station layout look like at the preferred site?. Updates were provided on the following technical topics:

Technical Updates

Ridership Forecasts – The effort to develop updated forecasts continues to progress. The preliminary projects of ridership to Boston are similar to the results of the 2003 study completed by KKO. The Team is currently looking at ridership to Providence and TF Green Airport. The initial forecasts

appear to be high based on the anticipated level of service. Some additional refinement is necessary. The draft forecasts should be complete by the end of the month.

Structural Review – The structural review of the historic station has focus on the slab that spans the tracks. The initial testing of the slab was completed at the end of the April. The preliminary results were provided to the City. These results indicated that the slab is in fairly decent shape. Additional tests will be needed should the design be progressed at the historic station site.

The review of the underside of the slab was conducted over three nights in mid-May. The Team was examining the structural steel members that are supporting the slab. The preliminary results indicate that the steel members are in decent condition. It appears that the damage/deterioration identified can be repaired. The full results of the structural review should be complete by the end of the month.

Operational Analysis – The focus of the efforts to date has been on the operational analysis. Since it is the main topic of today's meeting, the discussion will be deferred to Agenda Item 3.

Public Outreach – The initial Stakeholders Committee meeting was held on April 11th. At that meeting, a brief overview of the study was presented and an initial feedback was received.

The initial Public Meeting was held on May 18th. The agenda included an expanded overview of the project. The balance of the meeting was for public input.

A second series of meetings is planned for the fall once more of the Phase I and II technical work is completed.

Schedule Update

It is anticipated that the Phase I tasks will be relatively complete by the end of June. The Phase II tasks are expected to be complete by the end of September. Some Phase II efforts are already underway.

Summary of Initial Stakeholder Input

David Wilcock summarized the initial key stakeholder input. He noted that today's meeting is the fifth with key project stakeholders. The previous four meetings were a series of "one-on-one" discussions with key stakeholders (Amtrak, MBTA, RIDOT, and P&W). A brief summary of the four previous meetings was provided by David:

- Rhode Island Department of Transportation (RIDOT), February 23, 2006: The City and VHB met with Steve Devine (RIDOT) to coordinate the state's role in the study.
- Massachusetts Bay Transportation Authority (MBTA), March 13, 2006: VHB met with Dennis DiZoglio and Jody Ray to discuss their issues and concerns regarding the feasibility of stopping trains at a Pawtucket/Central Falls Station. The MBTA's primary concerns were: 1) impact on their existing schedule, 2) train loads (crowding), and 3) the need to stop on the main line tracks. The MBTA would have significant concerns if they were asked to run the entire commuter rail service schedule (both directions) on the FRIP track between Providence and Pawtucket/Central Falls.
- National Railroad Passenger Corporation (Amtrak), March 15, 2006: VHB conducted a teleconference with Drew Galloway, Tom Moritz, and Mike DeCataldo to discuss their issues and concerns regarding the feasibility of stopping trains at a Pawtucket/Central Falls Station. Amtrak's primary concerns are 1) that they do not want any trains stopping on the main line tracks and 2) that their schedule not be impacted.
- Providence and Worcester Railroad (PWRR), April 25, 2006: VHB met with Bernard Cartier and David Fitzgerald to discuss their issues and concerns regarding the feasibility of stopping trains at a Pawtucket/Central Falls Station. The PWRR's primary concerns are 1) capacity on Track 7 (FRIP Track), 2) platform clearances at either station location, and 3) if the yard site is selected for the station, a new yard location will need to be identified.

David noted that the input received at these four meetings was used to develop the initial operating concept for a Pawtucket/Central Falls Station.

Discussion of Phase I Train Service Feasibility

David Wilcock provided an overview of the operational analysis done to date. A copy of the draft operating plan and the sketch of suggested track improvements were provided to the attendees. Copies of these two items are attached for reference. It was noted that both the operating plan and track sketch are both station sites. He offered the following observations/assumptions developed by the Team:

- The issue of stopping commuter trains on the main line appears to be less of a concern during the morning peak period than during the evening peak period. In the morning, the only Amtrak train that is in the mix of inbound trains (to Boston) is No. 66, the overnight train from Washington. Otherwise, there do not appear to be any potential conflicts between inbound commuter and Amtrak trains.
- During the evening peak period however, there is the potential for more conflicts. There are two scheduled outbound (to Providence) Amtrak Acela Express trains (2171 (3:15 PM departure from Boston) and 2175 (5:20 PM departure)) and two Amtrak regional trains (175 (4:20 PM) and 177 (5:35 PM)) in the mix of trains.
- To account for a stop in Pawtucket/Central Falls, between 3 and 5 minutes was added to the Providence end of the trip (Inbound trains were adjusted to leave earlier; outbound trains were adjusted to arrive later).
- For initial planning purposes, every train currently turning at South Attleboro was extended to Providence. It was also assumed that any train originating/terminating at Providence would stop at Pawtucket/Central Falls.
- The draft operating plan is based on Amtrak's Spring 2006 schedule and the MBTA's October 2005 schedule.

Based on these operating assumptions, a draft sketch of suggested track improvements has been developed. As previously noted, these proposed improvements are for either station site. This sketch includes the following elements:

- The existing No 10 crossover connecting Track 7 to Track 1 located between the historic Pawtucket/Central Falls Station and Boston Switch is temporary. The improvement plan proposes a No. 20 crossover in the same location connecting Track 1 to Track 7.
- At Lawn Interlocking, it is proposed that the existing No. 15 turnouts be replaced with No. 20 turnouts.
- Based on these improvements, it is proposed that all inbound trains stop on Track 2; outbound trains could stop on either Track 1 or Track 7.
- It was noted that the track sketch was based on track charts and the Track 7 design plans used for the FRIP EIS. The Team has not received as-built track or signal system plans for the existing Northeast Corridor layout.

The following comments were offered on the draft operating plan and proposed track improvements:

- Tom Moritz and Mike DeCataldo reiterated Amtrak's concern about stopping commuter rail trains on the main line. They asked if it is possible to construct an inbound (eastbound) station track. D. Wilcock noted that the historic track layout through the old station was four tracks: two main line tracks in the center and platform tracks on the outside. If the current main line track layout cannot change (westbound main line in the middle, eastbound main line in place of inbound platform track), then a new track would need to be constructed east of Track 2. At the historic depot site there are the two adjacent bridges, the retaining wall, and the vertical support

for the existing station building that would be a challenge. Tom Moritz commented that a fourth track could fit without these issues at the Yard Site.

- Jody Ray questioned the use of Track 7 for the stopping of outbound commuter trains that might interfere with Amtrak operations. He noted that the overall time it would take to get the commuter rail train into the siding and the turnout/signals cleared for the through train was likely equal to or greater than the time required to simply stop the commuter rail train on main line.
- It was asked whether a layout for the platforms had been developed for either station site. D. Wilcock noted that platform concepts are under development for both sites. At the historic station site, the concept is for an island platform between Tracks 1 and 2 and a second island platform between Tracks 1 and 7. The tighter of the two locations is between Tracks 1 and 2. The team is looking at elevator and edge clearance requirements. Mike DeCataldo noted that the maximum authorized speed through the historic station area is 60 MPH. At either location, catenary poles will need to be relocated to accommodate the platforms.
- If commuter trains cannot stop on the main line and an eastbound station track is not feasible, then Track 7 would be used for stopping both inbound and outbound trains. Inbound trains would have to cross over from Track 7 to Track 1 to Track 2. It was noted that the closest crossover from Track 1 to Track 2 is at Hebronville (MP 193.5) approximately 3.5 miles east of the historic station. The impact to through operations of this option would appear to be more severe than stopping on the main line.
- Jody Ray commented that the new Providence Line schedule should be out in the next couple of weeks. This schedule eliminates several of the early morning outbound and late evening inbound trips. He also noted that the standard turn time built into the schedules is 20 minutes. A train can be turned in 10 minutes but they like to build extra time into the turn.
- Mike DeCataldo suggested that not every train needs to stop at Pawtucket/Central Falls. Some trains that potentially create a conflict could bypass the station. He reiterated Amtrak's concern about allowing commuter rail trains to stop on the main line. When asked about the cause for this concern, Tom Moritz and Mike cited the impact of a cascading delays to high speed service caused by a broken down commuter rail train, by one that is running late, or by a train delayed because of the need to board handicap passengers which can take up to four minutes.
- Headways between trains were discussed. It was commented that any schedule headway of five minutes or less would be considered tight. The schedule of Amtrak train 66 was discussed. Its schedule arrival time in Providence is 6:58 AM. It is sometimes held for up to 20 minutes to work round the MBTA service.
- Tom Moritz agreed that Amtrak's engineering and operations staff would take a look at a more detailed operating and track plan. He said that Amtrak would want to see the schedule with string lines. The station dwell time needs to be considered particularly the use of manual versus powered doors and handicap loading/unloading as well as the impact of a broken down train on overall corridor operations. He commented that the new station at TF Green Airport was faced with similar issues and that the resolution of these issues was to build it on a station siding.
- Tom asked how the preferred station site would be identified.
- D. Wilcock noted that the site selection between the historic station location and the yard location would occur as part of the Phase II study efforts this summer. The critical first step was to determine if it is even feasible to stop the trains. If trains can be stopped, the Phase II site selection criteria will include consideration of railroad operating issues, vehicular and pedestrian access, environmental impacts, cost and other categories of impact typically included by the Federal Transit Administration (FTA). Rich Davis noted that transit oriented development potential as well as economic impacts would be included.

Schedule/Coordination/Next Steps

The critical next step items include the following:

- Amtrak will provide the as-built track and signal plans. Tom Moritz told D. Wilcock to coordinate with Earl Watson in Philadelphia.
- The MBTA will provide the new Providence Line schedule.
- The Team will develop a new schedule with string lines.
- The Operational Analysis will be provided to Amtrak for review.
- The Team will look at a Track 4 option at the historic station site.
- Jody Ray requested that a copy of the schedule reviewed at today's meeting be e-mailed to him.
- Once the schedule has been revised by the Team and reviewed by Amtrak and the MBTA, this group will reconvene to finalize a schematic operating plan/track improvements plan that supports either station site alternative.

KWZ/kz/klw

Attachments

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility
Study and Site Analysis**

Stakeholder Coordination Meeting No. 05

With:

Amtrak

**Massachusetts Bay Transportation Authority
Providence & Worcester Railroad
Rhode Island DOT**

**June 5, 2006
1:00 PM – 3:00 PM**

- 1. Update of Project Scope of Services and Schedule**
 - **Phase I: Train Service Feasibility**
 - **Anticipated completion June 30, 2006**
 - **Phase II: Analysis and Comparison of Two Sites**
 - **Efforts Currently Underway**
- 2. Summary of Initial Stakeholder Input**
 - **Rhode Island DOT**
 - **MBTA**
 - **Amtrak**
 - **P&W**
- 3. Discussion of Phase I: Train Service Feasibility**
 - **Concept for a Station Stop**
 - **Track Changes**
 - **Operating Plan**
- 4. Schedule/Coordination/Next Steps**



Meeting Notes

Attendees: See attached sign-in sheet.

Date/Time: May 18, 2006

Project No.: 09736.00

Place: Visitor's Center, 175 Main
Street, Pawtucket, RI 02860

Re: Pawtucket/Central Falls Commuter Rail
Facility Feasibility Study and Site Analysis
Public Meeting #1

Notes taken by: K. Wickham Zimmerman

On May 18, 2006, the first public meeting for the Pawtucket/Central Falls Commuter Rail Feasibility Study and Site Analysis was held. The purpose of the meeting was to provide an overview of the study and to obtain input from the public. A summary of the meeting's key discussion point follows:

Introduction

Mike Cassidy, Director of Planning for the City of Pawtucket, opened the meeting with a brief introduction and a brief history of the project. Mr. Cassidy identified the local elected officials and/or their representatives present at the public meeting. Additionally, Mr. Cassidy noted that a spanish translator was being made available for the meeting for anyone needing assistance..

Presentation

David Wilcock, VHB Project Manager, introduced the project team and its members; provided a brief overview of the Federal Transit Administration Planning Process; and presented an overview of the project. Attached are copies of the slideshow utilized during the presentation, as well as handouts distributed at the meeting.

Mr. Wilcock explained that the Cities of Pawtucket and Central Falls have recently initiated a study to assess the feasibility of restoring the historic station and commuter rail service to the area. The approach of the study is to answer three key questions:

1. Is commuter rail service to Pawtucket/Central Falls feasible?
2. Which of two sites provides the best opportunities, and what will the site look like?
3. How would a commuter ail station impact that surrounding communities?

It was explained that during the first stage of this project an operational assessment of the service will be performed in order to determine if, in fact, commuter rail service can actually stop in the Pawtucket/Central Falls area. It was also explained that a key element of the project is coordinating with the operating railroads - the Massachusetts Bay Transportation Authority (MBTA), Amtrak and the Providence & Worcester (P&W) Railroad. A series of meeting have been held with each of

the operating railroads in order to identify their concerns and subsequent meetings will be held in order to determine if stopping service at a Pawtucket/Central Falls station is possible.

Mr. Wilcock explained that two alternative sites have been identified as potential locations for the commuter rail station. The sites include the location of the historic Pawtucket/Central Falls Station and the existing P&W railyard located immediately west of downtown Pawtucket.

It was explained that the first phase of the project is intended to be completed by the end of June 2006 and at that time the feasibility of providing commuter rail service to the station locations will be determined. Assuming that the service is found to be feasible, the next round of stakeholder and public meetings will be held in the Fall to present the findings of the site assessments. It is intended that the remainder of the project will be completed by January of 2007.

Public Comment Period

At the conclusion of the formal presentation, the meeting was opened up to the public for questions and comments. It was asked that individuals identify themselves by name and affiliation and to the extent possible; the individuals are identified in these meeting minutes.

Mike Cassidy noted that Mayor Doyle had joined the meeting and that Charlie Hawkins of Sen. Chafee's office was also present. Mayor Doyle stated how critical it is to have the support of the FTA and of Senators Reed and Chafee on this project. Without support this project will not happen. Mayor Doyle stressed that this has been a long and arduous process over the last four or five years, but that the City will continue to work closely with the State's delegation to progress the project. Mayor Doyle also explained that this public meeting is a critical meeting and that the comments of the public will go a long way. The station project is a critical enhancement of the City in an area that is considered rundown and can result in a resurrection of the Barton Street neighborhood.

It was asked how long it would be before the project was completed. David Wilcock explained that it could be four to five years before construction, assuming that the project is found to be feasible and the process goes smoothly. He explained that there is a competition for federal monies on both a local and national level and that securing these funds could provide an additional complication.

Ralph Johnson of North Scituate asked if the additional track is to be considered part of the feasibility evaluation and if it would allow trains to stop. David Wilcock stated that additional tracks were being considered, however it would be preferable to use existing tracks, as there are issues such as the existing retaining walls at the historic P/CF Station site which could be quite costly. The feasibility study will document and show the additional track as an option.

Joe Haskett, Resident, asked if there were local examples of transit projects that have had impacts on areas, such as in Lawrence and Lowell. David Wilcock explained that Lawrence was able to build a new intermodal station, but that they already had bus service in the area. The Lowell- Gallagher terminal has helped the City, particularly with the connection to downtown. Historically, it has been found that transit projects similar to the proposed Pawtucket/Central Falls Station project have provided benefits in urban areas. Other examples include Canton Center where developments, including businesses and residential, have occurred around the station. Attleboro is also looking at opportunities for development in the area.

Barry Schiller, North Providence, suggested that RIPTA be included in the design of the station. He explained that RIPTA currently can't go across the state line to serve the South Attleboro station, so a connection to the Pawtucket/Central Falls station would be important. Mr. Schiller also stated that

he was concerned about the time it would take to complete the project and suggested that the study look at the Connecticut Shoreline East project and see how it was expedited. Additionally, Mr. Schiller stated that with the cost of gas, having this service is both a regional and statewide issue.

A local resident and commuter rail rider stated that she supports commuter rail in Pawtucket, having seen the benefits in Lowell. It was asked if ridership and the costs to riders will be evaluated. It was noted that an increase in cost to riders will result in public outcry. David Wilcock stated that ridership will be evaluated using available historic and demographic information in order to make the best forecast. He stated that the study will look at the costs per rider and that it is understood that the MBTA is currently looking at a system-wide fare increase, which will be taken into consideration in this study. Mr. Wilcock also noted that the MBTA is a Massachusetts authority and that although they are willing to operate services to NH and RI, they will only do it if the costs for the service are covered.

Felicia Delgado, Resident, stated that she is representing the local neighborhood individuals who could not be in attendance. Ms. Delgado expressed concerns with the Mayor's statements about defacing the area and utilizing terms like "salvation". Ms. Delgado expressed concerns that the people of Boston will come down to Pawtucket and buy property now and use the trains, driving out people who live in the neighborhood today. She noted that people in the neighborhood are concerned about what will happen to the area and that she would like to revitalize the area instead of deface it.

Mayor Doyle stated that the Barton Street neighborhood is an important area in the City. He does not want to displace the residents in the area, rather he wants to integrate and improve the area. The Mayor stated that similar to the Nickerson/Cherry Street areas, he wants to make the neighborhood the best that it can be.

Nancy Callaghan, PCDC, stated that she has put up houses on Nickerson, High, and Cherry Streets and that she has concerns about traffic and residents being pushed out. She wants to hear that houses will be respected, affordable housing will be maintained and that the individuals will not be driven out.

Nancy Whit, PCDC, introduced Felicia Delgado as the new outreach coordinator for the Barton Street neighborhood. Ms. Whit asked how much land is typically taken for transit-oriented development (TOD) and what the requirements are for housing. David Wilcock explained that there are no specific requirements for TOD. The TOD concept supports development around transit uses or in adjoining neighborhoods. Mr. Wilcock explained that although the examples cited for TOD including housing, there are other types of development supported in TOD. The Canton example just happened to be condominiums of which some are families and some are individuals on a five to six acre site. Mr. Wilcock stated that he would get Nancy more detailed information on the Canton area and on other TOD projects so that Ms. Whit can understand that various scales of TOD that are possible.

Lisa Bolashere, Resident, stated that she previously lived in Boston and worked for the Massachusetts Executive Office of Transportation and Construction (EOTC) and spent many years commuting. Ms. Bolashere stated that the cities of Pawtucket and Central Falls need to have this station and need to go for the market in Boston. She would like to see everyone in the neighborhood have an opportunity to travel to other locations for work. Ms. Bolashere stated that she is 100% behind this project somewhere in the Pawtucket/Central Falls area. She did, however, express concerns about property value levels in the nearby neighborhood. Mr. Wilcock explained that TOD does not just include condominiums, but it also includes other businesses. Another important part

of this project, in addition to access to Boston, is access to Rhode Island and points south to Warwick and Wickford Junction. This opens up opportunities for other job locations and the TOD also opens up employment opportunities in the neighborhood.

Marguerite Pile, Bailey Street Lofts Board, stated that she is concerned about waiting five years for this station and service. Ms. Pile asked what individuals can do to help facilitate project and asked what types of economic development opportunities exist or if there existing resources that can be utilized. Mr. Wilcock stated that funding is critical to the success of this project. The sooner that the funds are secured for the project, the sooner the project can move forward. He explained that the competition for funds is intense and that the more vocal a community is about the desire for a project, the it will demonstrate the importance of a project for both community and federal administrators. Mr. Wilcock suggested that supporters of the project contact their congressional delegation voicing their support of the project.

Tucker Densley, Resident and Commuter for 11 yrs, stated his support of the project. Mr. Densley would love this to this project to happen. He has ridden the train most of his life and find it is a less expensive alternative to driving. Mr. Densley stated that the concerns of the community should be paramount and that they should be included in the process. Mr. Densley's first choice of locations for a station is the historic train station site.

It was suggested that bike racks be included in the station.

Geoff Hunt, Cohasset MA and Pawtucket Insurance Co, stated that he's never been associated with a community that has been so involved in creating a vision. He stated that "renaissance" and "rebirth" are good terms and noted that it took 16 years to get the MBTA Greenbush Line built. Mr. Hunt asked who, in addition to the MBTA, would approvals be required from for the project. Mr. Wilcock stated that there are four primary stakeholders - Amtrak, the MBTA, RIDOT and the P&W Railroad. Mr. Wilcock noted that the project team will work with these stakeholders to determine the feasibility of the project. Amtrak is the owner of the rail line and their primary concern is that their Boston to New York City Acela and regional service be protected. The MBTA's position is that the costs of the service will need to be covered. RIDOT currently has an agreement with the MA Executive Office of Transportation (EOT) for service in Rhode Island. The service levels will change soon to 18 roundtrips. The P&W Railroad uses the FRIP track and is concerned about impacts of others utilizing this track. Once the feasibility of the service is determined, then it will be necessary to review the costs associated with any necessary improvements.

It was asked if there has been an analysis of the structure and if it is possible to reuse the existing facility. Mr. Wilcock stated that with the cooperation of the developer, a structural analysis of the slab of the building is being performed. By performing a condition assessment of the building pad and the underside of the structure over the railroad tracks, it will be possible to determine if it is reusable. Mr. Wilcock noted that only the building pad, and not the entire building structure, is being evaluated for the purposes of this study. Mr. Wilcock stated that the evaluation is being performed using ground-penetrating sonar to scan the slab and determine its condition. It was asked if the slab is found to be sound, could it be assumed that the building is also sound. Mr. Wilcock said that this could not be assumed. He went on to explain that it could be expensive to remove the building slab over the railroad tracks; that the building is eligible for the National Historic Register; and that federal dollars could not be used to tear down the structure.

Thomas Cute, Bus operator for RIPTA, stated that transit development is good for the community and will have a great impact in the Blackstone Valley. Mr. Cute would like to see a seamless connection between rail and bus and would like bus to be taken into consideration in the station. Mr.

Cute stated that this project will revitalize the downtown as a liveable community and that it is a good project for the City.

George Johnson, Resident for 47yrs, stated that he is very supportive of this study and the findings of the feasibility study. Mr. Johnson stated that finding the funds for the project is key and that when doing the Transportation Improvement Program (TIP) the project can not be included unless the funds are available. Mr. Johnson stated if transit comes to the area it will have an impact on the rest of City and on other transit modes.

A resident stated concerns about the traffic in the area and asked what will be done about that issue. David Wilcock stated that the impacts to traffic and parking will be evaluated in Phase 2 of the project, and methods for managing them will be identified.

Maia Small, PADS, stated that she is a supporter of the project and noted that this is an urban train station, different than the South Attleboro Station. This station will be very walkable and many riders won't need a car. She noted that this is a beautiful public building and space and that it is important to support it. Additionally, it was noted that there are many neighborhood concerns and that it will be important to listen to them.

It was stated that this meeting was focused on the train station, but that there should be other planning in the neighborhoods, maybe looking at tax increment financing to develop affordable housing.

It was noted that the beautification of the streets and the surrounding area was not mentioned. Mr. Wilcock noted that the station project is supportive of the surrounding areas and its context.

It was asked what would happen if this project if found to be infeasible. Mike Cassidy stated that this certainly is a possible outcome and that we should know the answer in another six weeks. Once it is determined if the project is feasible or infeasible, it will be possible to develop a plan to proceed.

Mike Cassidy closed the meeting by explaining that the project team would continue to coordinate with the individual stakeholders and that another public meeting will be held in the Fall.

Attachments:

Sign-in Sheet

Agenda

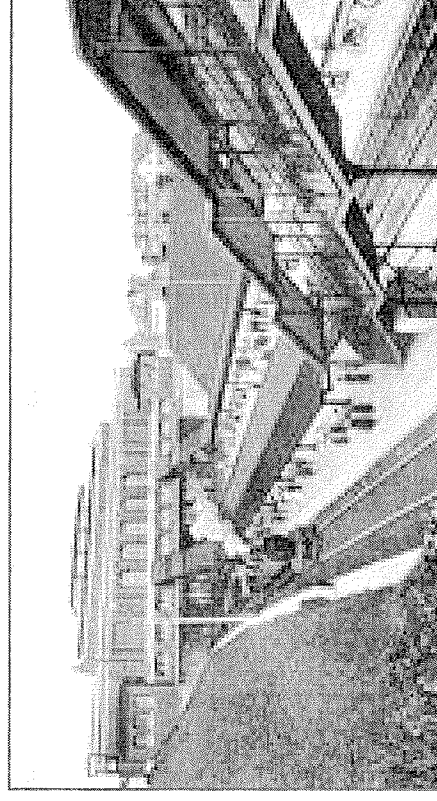
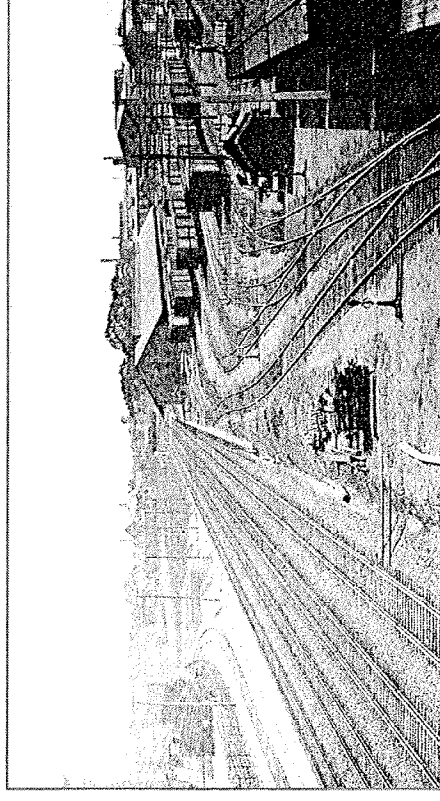
Powerpoint slides/handout

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Public Meeting #1 May 18, 2006 7PM – 9PM

Agenda

- Introductions
- Project Team
- FTA Planning Process
- Project Overview
- Issues/ Needs
- Next Meeting
- Public Comment Period





Pawtucket/Central Falls Commuter Rail Facility – Public Meeting #1

May 18, 2006

Vanasse Hangen Brustlin, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Agenda

- 1. Introductions
- 2. Project Team
- 3. FTA Planning Process
- 4. Project Overview
- 5. Issues/Needs
- 6. Next Meeting

Vanasse Hangen Brustlin, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Project Team

- 1. City of Pawtucket
- 2. City of Central Falls
- 3. Pawtucket Foundation
- 4. Consultant Team

Vanasse Hangen Brustlin, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Consultant Team

- 1. Vanasse Hangen Brustlin, Inc. (VHB)
- 2. URS Corporation
- 3. Domenech Hicks & Krockmalnic
- 4. Gordon R. Archibald, Inc.
- 5. Public Finance Management
- 6. Public Archeology Laboratory, Inc.

Vanasse Hangen Brustlin, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

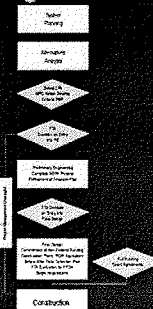
FTA Planning Process

- 1. Systems planning and alternatives analysis
- 2. NEPA and preliminary engineering
- 3. Final design and full funding grant agreement
- 4. Construction

Vanasse Hangen Brustlin, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

FTA Planning Process



Vanasse Hangen Brustlin, Inc.

Project Overview

- What can the Commuter Rail Facility do for the Pawtucket and Central Falls region?
 - ▷ Be a catalyst for future development (transit-oriented development)
 - ▷ Become a regional attraction
 - ▷ Communicate unique sense of place
 - ▷ Provide transportation options/services

Project Approach

- A focused, deliberate approach that sequentially addresses the three fundamental questions:
 - ▷ Phase I - *Is Commuter Rail Service Feasible?*
 - ▷ Phase II - *Which Site Provides the Best Opportunities?*
 - ▷ Phase III - *What Will the Site Look Like? How Will It Impact the Community?*

Phase I – Feasibility Analysis: *Is Commuter Rail Service to Pawtucket/ Central Falls Feasible?*

- Rail Operations
- Track and Systems
- Equipment



Phase II – Site Conditions Analysis: *Which of the Two Sites Provides the Best Opportunities?*

- Site Conditions Analysis
 - ▷ Layout
 - ▷ Access
 - ▷ Environmental
- Transit Oriented Development
- Finance and Funding



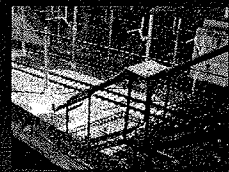
Phase III – Evaluation and Site Design: *What Will the Site Look Like and How Will It Impact the Community?*

- Evaluation
- Vision
 - ▷ Design
 - ▷ Site Access
 - ▷ Parking
- Public Process



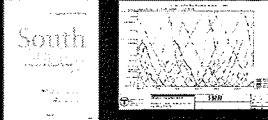
Phase I – Train Service Feasibility Analysis

- General Requirements
- Station Stops
 - ▷ Historic Location
 - ▷ P&W Yard
- Existing Operations
- Operational Issues
 - ▷ Amtrak
 - ▷ MBTA
 - ▷ Providence & Worcester Railroad



Rail Operations

- ▣ South Station Capacity
- ▣ PM Peak Period Corridor Constraints
- ▣ Coordination with Other RI Rail Initiatives



Track and Systems

- ▣ Signal System Design
- ▣ Track Geometry
- ▣ Platform Layout



Equipment

- ▣ Ridership
 - ▷ Providence/Attleboro Line
 - ▷ Other RI Commuter Rail Initiatives
- ▣ Consist (Train) Make-up
- ▣ Impact Analysis

Public Process

- ▣ Stakeholder Committee
- ▣ Public Meetings
- ▣ Individual Stakeholders



Work Plan and Schedule

Phase 1 – Train Service Feasibility

- ▣ Train Service Feasibility – June '06

Phase 2 – Site Analysis & Comparison

- ▣ Site Conditions Analysis – June '06
- ▣ TOD Analysis – September '06

Phase 3 – Evaluation & Site Design

- ▣ Project Evaluation – September '06
- ▣ 10% Design and Cost Estimate – October '06
- ▣ Development & Implementation Planning – December '06
- ▣ Final Report – January '07


Next Steps

- ▣ Structural Inspections
- ▣ Historic Evaluation
- ▣ Operations Analysis
- ▣ Ridership Estimates
- ▣ Traffic Analysis
- ▣ Phase 1 Site Assessment

Public Comment Period

- Q&A
- Comment sheet
- Email: maras@psdri.net

City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis

| Date: April 11, 2006 - May 18, 2006 | | Time: 3:30 PM - 5:30 PM - 7 PM | Location: Visitor's Center 2 nd Floor Conference Room 175 Main Street Pawtucket, RI 02860 | | Page: 6 | |
|-------------------------------------|---|--------------------------------|---|--------------|---------|---------------------------|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| ✓ | MAIA SWAN | PADS | 10 EXETER ST. #406 | 401/475-2624 | | maia@thw102small.com |
| ✓ | Felicia Dufresne | PADC. | 315 Elmwood Ave. | | | |
| ✓ | Ann Belli | self | 300 Grand St #109 Pawtucket | 401/862-2957 | | Annbelli@Ade.com |
| ✓ | HARVEY GOULET | CITY | 190 RANDALL ST | 723-4515 | | |
| ✓ | LISA GROLAKSHARE | Pawtucket | 292 Lonsdale Ave | 548-7170 | | LM61964@yahoo.com |
| ✓ |  | Pawtucket Housing Authority | 214 Roosevelt Ave | 721 6010 | | Patrick M Hawthousing.org |
| ✓ | Marguerite Pile | self Baylog St Lofts | 28 Baylog St #106 | 02860 | | mrop19@excite.com |
| ✓ | Milagros Ramos | self PADC | 58 Olive st | 02860 | | milagrosramos@netmail.com |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

| Date: April 11, 2006 - May 18, 2006 | | Time: 3:30 PM - 5:30 PM | 7 PM | Location: Visitor's Center 2 nd Floor Conference Room 175 Main Street Pawtucket, RI 02860 | | Page: 7 | |
|-------------------------------------|----------------------------------|--------------------------------|--|---|-----|-----------------------------------|--|
| X | Name | Representing | Address | Phone | Fax | E-mail | |
| ✓ | THIERNO BAH | PAWTUCKET INSURANCE CO | 25 MAPLE ST - Pawtucket RI 02860 | 401 725-5000 | | THIERNO @AOL.COM | |
| ✓ | Pete Kenney | Walker Parking | Boston, MA | 617 505040 | | Pete Kenney @WalkerParking.com | |
| ✓ | MAURICE DOYLE | CITY | CITY HALL | 728 0572 | | | |
| ✓ | FRED LOVE | PAWTUCKET HIST. DIST. COMM. | 25 BEACONT PAWTUCKET | 401-724-3199 | | FRED LOVE HISTORIC.COM | |
| ✓ | Charles + Consuelo Sherida | . | 45 ARISTON | 723-5972 | | ESTHER BAJ @BROWNEDU | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

| Date: April 11, 2006 | | May 18, 2006 | Time: 3:30 PM - 5:30 PM 7 PM | Location: Visitor's Center 2 nd Floor Conference Room 175 Main Street Pawtucket, RI 02860 | | Page: 4 | |
|----------------------|-------------------|--------------------------|--|---|--------------|---|--|
| X | Name | Representing | Address | Phone | Fax | E-mail | |
| | Peter Seelander | SMPO | Memphis TN 38100 | 901 327 7626 | 901 324 2066 | iko@smpr.com | |
| | Alexander Flogy | | 5858 R. Highway Central Falls, RI | | | | |
| | Carb Flogy | | 20 Cherry St Pawtucket | | | | |
| | Robert J. Flogy | Pawtucket Insurance | 20 Cherry St Pawtucket | 401 725-5650 | | Robert Flogy 914-911-9111 Pawtucket, RI | |
| | Myndy M Walker | Resident | 25 Maple | | | MMWalker55@ verizon.net | |
| | Marlene P. Thomas | Resident | Twentyfour Lofts | 617 680-2888 | | RPWARNER@ DIVERFROOT. RIFELSPI.COM | |
| | Marvin P. Flogy | | 925 Corners St | 401-480-9550 | | | |
| | Thomas Cate | ATU 618 Union (RIPRA) | 172 Longfellow St Pawtucket RI 02860 | 401 722 0809 | | thomas.cate2 @Yahoo.com | |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

Meeting Attendance Sheet

| Date: May 18, 2006 | | Time: 7:00 PM | | Location: Visitor's Center 175 Main Street Pawtucket, RI 02860 | | Page: 1 |
|--------------------|-----------------------------|------------------------------|---------------------------------------|--|----------|-------------------------------|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| ✓ | Jeff Robinson | WLNE TV | 10 Quins | 453-8000 | | jrobinson@aol.com |
| ✓ | Andrew Spingarn | | 88 Pleasant St Pawt. | 728 6590 | | |
| ✓ | Corinne Teed | Connections Co-op | 570 Broad St providence | 273-3500 | | connections@nseup.net |
| ✓ | Nino Gordon Riley | Artist in Pawtucket | 75 Montgomer St. Pawt. | 481-8811 | | wimgor@verizon.net |
| ✓ | Andrew Louis Plasnik | G-Media/ Pawt. Foundation | 126 Union Street Pawt. | 783-2930 | | andrew@gnedie.tv |
| ✓ | Cheryle Ihrig Jack Ihrig | Northern Plaza Apts | 301 Main St Pawt. RI | 722-7310 | 728-2440 | Northern Plaza Verizon.net |
| ✓ | Barry & Libby Schily | Citizens! | 76 Sunset No Pawt. | 353-6536 | | bschilly@ricredy |
| ✓ | BETTY ULLMAN | MYSELF + FAMILY | 147 BEECHWOOD PAWT. | 725-8943 | | |

City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis

| Date: April 14, 2006 May 18 | | Time: 3:30 PM - 5:30 PM 7pm | | Location: Visitor's Center 2 nd Floor Conference Room 175 Main Street Pawtucket, RI 02860 | | Page: 2 | |
|--------------------------------|------------------|--------------------------------|-----------------------------------|---|-----|-------------------------------------|--|
| X | Name | Representing | Address | Phone | Fax | E-mail | |
| ✓ | RUSSELL FERLUGNO | PAWT. ZONING | 126 SLAZER PK NW PAWTUCKET, RI | 728-2727 | | | |
| ✓ | MARY GRAY | City Council | 7 Cooper ST 02860 | 728-8375 | | | |
| ✓ | ART HANSEN | Pawand DOT-CF | | | | | |
| ✓ | LINDA DEWING | Riverfront Lofts | Ten Exchange Ct #805 | 727 4700 | | ldewing@ riverfrontlofts. com | |
| ✓ | NANCY CALLAGHAN | P.C.D.C. | 423 LONGDALE | 722-1357 | | NANCY@VORONET.ATT NET | |
| ✓ | Debra Atellan | 228 High St Pawt | | | | | |
| ✓ | DANIEL KELLEY | | 456 ROBINSON NO. SOUTHE | 508/761-8179 | | | |
| ✓ | Paul Judoff | city @ KARGE | | 722-5300 | | PROVNET @ AOL.COM | |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

| Date: April 11, 2006 May 18, 2006 | | Time: 3:30 PM--5:30 PM 7PM | | Location: Visitor's Center 2 nd Floor Conference Room 175 Main Street Pawtucket, RI 02860 | | Page: 3 |
|-----------------------------------|----------------------|--|---|---|-----|------------------------------------|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| ✓ | Eleanore Flaherty | - | 71 Young ST 02860 | 722-1649 | | |
| ✓ | FLOR C. CONSTANZA | | 11 Nickerson St Pawtucket, RI 02860 | 727-3298 | | Florcell@ zol.com |
| ✓ | David Clemente | City Council | 218 Morris Ave. Pawtucket, RI | 722-2365 | | |
| ✓ | Rick Goldstein | MAYOR'S OFFICE | 137 ROOSEVELT AVE. PAWT UCKET, RI | 728-0800 X 358 | | RGOLDSTEIN @PAWTUCKETRI. COM |
| ✓ | JOHN MITCHELL | WARWICK RICS | P.O. BOX 881058 Pawtucket, RI 02860 | 722-475 6036 | | THE MITCH @MAC.COM |
| ✓ | Tom Moses | 11 | 170 Washington St. Pawtucket, RI 02860 | 453-3600 | | TMoses@ mosesaffairs.com |
| ✓ | TOM MAGILL | MAGILL FORD MAYOR - PAWT UCKET, RI | 44 EAST AV PAWTUCKET, RI | 722-8683 | | TOMMAGILL @HOTMAIL |
| ✓ | Dennis Riley | Gen Road | Fed Courthouse Pawtucket, RI | 528-5700 | | |

City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis

| Date: April 11, 2006 5/18/06 | | Time: 3:30 PM - 5:30 PM 7 PM | | Location: Visitor's Center 2 nd Floor Conference Room 175 Main Street Pawtucket, RI 02860 | | Page: 4 | |
|------------------------------|------------------------|--------------------------------------|-----------------------------------|---|----------|--|--|
| X | Name | Representing | Address | Phone | Fax | E-mail | |
| ✓ | Silvia Acevedo | PCDC | Pawtucket 310 West Ave | 726-1173 | 725-3261 | Silvia Acevedo Pawtucket@mac.com | |
| ✓ | Rev. Edmund Fitzgerald | (SELF) | 125 BUCKINGHAM ST APT. 4 | N/A | N/A | N/A | |
| ✓ | DAVE CHAMIELEWSKI | SELF | 56 ARLAND DR. PAWT 02861 | N/A | N/A | N/A | |
| ✓ | PAUL MOWNEY | Preservation Society of Pawtucket | 62 Park Place | 725-9581 | 726-0973 | Pawtucket Preservation Verizon.net | |
| ✓ | John Barry | City Council | | 723-3739 | | | |
| ✓ | Tom Moritz | | 58 High Pointe Chockville PA | 715-349-7094 | | | |
| ✓ | Matthew Caron | | | | | | |
| ✓ | Tucker Disney | (SELF) | 7 Homestead Pawtucket 02860 | 401-965-0911 | | tuckerdisney@mac.com | |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

| Date: April 11, 2006 - 5/18/06 | | Time: 3:30 PM - 5:30 PM 1 PM | Location: Visitor's Center 2nd Floor Conference Room 175 Main Street Pawtucket, RI 02860 | | Page: 5 | |
|--------------------------------|-------------------|--|---|--------------------|---------|-------------------------------|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| ✓ | ARL HECKMAN | CORNISH ASSOCIATES | 40 BOEN PVD, RI | 401 421 0254 | | ARL-HECKMAN @CORNISHA.COM |
| ✓ | STEPHANIE FONTANA | Pawtucket Foundation Phyllis/Byron | 2884 Weymouth St SOS 02860 | 335 38012 | | |
| ✓ | DON GLOBE | CITY OF PAWTUCKET CITY COUNCIL | 10 VINE ST 02861 | 401 788-0558 | | DEAGLOBE@CORNISHA.COM |
| ✓ | Patricia McAlpin | Citizen Pawtucket Blue Stone Valley Township Council | 123 Cottage St Pawtucket RI | 401 725-2750 | | Patricia McAlpin@yahoo.com |
| ✓ | David MORAN | Councilman | 127 Beaver St. | 727-2597 | | |
| ✓ | Kevin STACOM | WARWICK RICS | 175 Cross Street Warwick | 862-1826 | | |
| ✓ | Rolls Johnson | - | 10 Widdoway No. Scituate RI | 934- 0299 | | rolls@ earthlink.net |
| | | | | | | |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

| Date: April 11, 2006 | | Time: 3:30 PM – 5:30 PM | Location: Visitor's Center 2 nd Floor Conference Room 175 Main Street Pawtucket, RI 02860 | | Page: 2 | |
|----------------------|-------------------------------|-------------------------|---|--------------|----------|---|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| ✓ | Greg Sawd | PRA | 175 Main St | 724-5200 | | SSCOWN@freedomnationhandbook.com |
| ✓ | Jan Sullivan | Pawtucket Foundation | | 728 3305 | | |
| ✓ | Colleen Daley Nadeau | PCDC | 210 West Ave Pawtucket | 726-1173 | 725-3261 | colleen.daley.nadeau@pawtucketri.org |
| ✓ | Steve Devine | RI DOT | 2 Capital Hill Dr | 222-4203 | 222-2207 | stdevine@dot.state.ri.us |
| ✓ | Roberto Martinez | | 9 Montpon St. | 724-9175 | | |
| ✓ | Jerry Sklar | Property owner | 5858 Redfern Ave Menton, RI 02882 | 901 767-3883 | | jsklar@jhs-law.com |
| ✓ | Joe Hallett Kensley Murphy | CITIZENS | 165 Broad St Pawtucket, RI | 475-7514 | | JHallett@unicebrown.org SMURPHY@unicebrown.org |
| ✓ | Jenna Connolly | CITIZENS PADS MEMBER | 34 CENTRAL AVE | 508.923.3322 | | JOONNOLLY@OCEANSPRAY.COM |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

Meeting Attendance Sheet

| Date: May 18, 2006 | | Time: 7:00 PM | | Location: Visitor's Center 175 Main Street Pawtucket, RI 02860 | | Page: 1 | |
|---------------------------|------------------|--|---|---|----------|--|--|
| X | Name | Representing | Address | Phone | Fax | E-mail | |
| ✓ | Liz Wozny | Historic 207 Cem Preservation Society | 33 NOTTINGHAM way PAWT. | 401-728-7707 | | | |
| ✓ | Michele Roberts | Pawtucket Foundation | 255 Boxwood Bridgewater, MA 02334 | 508-223-6878 | | | |
| ✓ | Nancy J. Whit | PCDC | 210 West Ave | 401 726-1173 | | | |
| ✓ | Kim Hadley | PCDC | 210 West Ave | 726 1173 | | | |
| ✓ | Chadwick Simpson | Artist on Montgomery St. | 75 Montpelier | 333-331-4519 | / | | |
| ✓ | Amy Jean Ramello | ARTIST | EMERALD BOUND ART STUDIO 10 Exchange Ct #6014 PAWTUCKET 02860 c: 401.439.2534 | N/A | | AJRAMERO @janco.com | |
| ✓ | George Johnson | RI STATEWIDE PLANNING PROGRAM | ONE CAPITAL HILL 02907 PROVIDENCE RI | 222-6490 | 222-2083 | Johnson @ planning.state. ri.us. | |
| ✓ | Brenda Schum | SELF EMPLOYED | 20 Exchange Ct #604 Pawtucket | 475-7174 | | brenda.schum @gmail.com | |

City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis

| Name: | Address: | Email: | Phone |
|------------------|--------------------------------|---|-----------------|
| Patricia Malpino | 123 Cottage St Pawtucket RI | Patricia Malpino Patricia.Malpino@yahoo.com | 401 735-2750 |

Comments:

Did not want to say too much at meeting
But I would add that with to address concern
of local neighborhood and sense of place
that I support redevelopment of historic Train Station
and that once the planning gets to that stage
That perhaps Development of the old Train Station
could be an opportunity to showcase via Exhibit
Space the Ethnic Diversity of the Neighborhood
as well as the history.
I agree with comment that any residential Dev be made
affordable and retain character of the
Neighborhoods and perhaps Downtown Amenity
Needs should be addressed.

Written comments may be handed in after the public meeting, mailed to the City of Pawtucket, Department of Planning and Redevelopment, 175 Main Street, Pawtucket, RI 02860, or emailed to Susan Mara at maras@psdri.net.

City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis

| Name: | Address: | Email: | Phone |
|----------------|-------------------------------------|-----------------------------|----------|
| Cheryle Ithrig | Northern Plaza 301 Main St, Pawt | Northplaza1@ verizon.net | 722-7310 |

Comments:

After discussing the details of eminent domain
"VS" private sale with the residents of Northern
Plaza Apts. it is clearly evident that most
residents prefer the City of Pawt. to own the
train station. The statements & comments are -
"The city will look out for what's best when it
comes to our children, families & elderly. A
private developer is only interested in how
much money they can make

Written comments may be handed in after the public meeting, mailed to the City of Pawtucket, Department of Planning and
Redevelopment, 175 Main Street, Pawtucket, RI 02860, or emailed to Susan Mara at maras@psdri.net.



Vanasse Hangen Brustlin, Inc.

99 High Street, 10th Floor
Boston, Massachusetts 02110
617 728-7777
FAX 617 728-7782

Meeting Notes

Attendees: See Attached Sign-In Sheet

Date/Time: October 24, 2006; 7:00 PM

Project No.: 09736.00

Place: Visitor's Center, 175 Main
Street, Pawtucket, RI 02860

Re: Pawtucket/Central Falls Commuter Rail
Facility Feasibility Study and Site Analysis
Public Committee Meeting #2

Notes taken by: M. Dixon

The purpose of the second public meeting was to introduce the results of the first phase of the project; provide an overview of the scope of services and schedule for the next phase; and discuss the process of evaluating the alternative sites. A copy of the agenda and PowerPoint presentation is attached for reference.

Results of Phase I Analysis

Introductions were made by Michael D. Cassidy (MDC), Director of Planning and Redevelopment for the City of Pawtucket.

David C. Wilcock (DCW), VHB Project Manager, recapped the three-step approach to the study, which is designed to answer three questions: 1) Is commuter rail service to Pawtucket/Central Falls feasible?; 2) If service is feasible, which of the two sites identified is the better location for a station?; and 3) What could the station layout look like at the preferred site?.

DCW explained that VHB had concluded Phase I activities and found that commuter rail service to Pawtucket/Central Falls is feasible. He proceeded to present the detailed results of Phase I tasks, including the operations analysis, ridership forecasting, and structural evaluation of the historic station building.

DCW introduced the scope of the operations analysis used to determine the physical viability of stopping trains in Pawtucket/Central Falls without impacting the existing users of the Northeast Corridor (NEC). These users include Amtrak's inter-city service, the Massachusetts Bay Transportation Authority's (MBTA) existing commuter rail service, and the Providence and Worcester Railroad (P&W) freight service. DCW noted the concerns of these users, such as Amtrak's concern about stopping trains on the mainline tracks and P&W's concern about platform clearances on the freight (FRIP) track. He also stated that service to Pawtucket/Central Falls would need to be coordinated with the Rhode Island Department of Transportation's (RIDOT) plans to extend commuter rail service to South County.

DCW explained the assumptions used for the operations analysis. The schedule was based on Amtrak's Spring 2006 schedule, the MBTA's July 2006 schedule, and the most recent P&W freight schedule. It was assumed that a station stop at Pawtucket/Central Falls would add 3 minutes to the scheduled running time, that trains need 10 minutes to change direction at Providence, and that

MBTA and Amtrak trains should be separated by at least 10 minutes at Providence Station. Any train violating these constraints could not be stopped at Pawtucket/Central Falls.

DCW stated that based on these schedules and assumptions, 23 of the 30 existing scheduled trains could stop at Pawtucket/Central Falls, including 6 of 7 during AM peak and 5 of 6 during PM peak. Two peak hour trips would also provide service to and from Providence. He noted that the scheduling of service is dynamic and changes over time. This analysis represents a "snapshot" used to assess overall viability. Based on the number of trains that are able to stop, a viable level of service can be provided for a station at Pawtucket/Central Falls.

DCW proceeded to introduce the ridership forecast, including the ridership shed areas for both auto and alternative modes of access. The ridership forecast was based on the 2000 Census, the 2000 Journey to Work, the RIDOT statewide model, the Central Transportation Planning Staff (CTPS) regional model (Massachusetts), Rhode Island Public Transit Authority (RIPTA) bus schedules, and MBTA fares and schedules. DCW stated that in 2030 there would be an estimated 1100 riders to Boston, 250-550 to Providence, and 150-170 to TF Green Airport. Between 64% and 74% are projected to drive to the station, 13% would be dropped off, 11-23% would walk, and remaining users would take transit. He stated that these numbers were in line with MBTA experience at stations in similar settings with similar demographics, such as Hyde Park station in Boston. He also noted that the forecast for the percentage of riders accessing the station by walking was conservative, being less than that of stations in the MBTA system with similar residential densities. Such stations include Hyde Park and Canton Center, where 36% and 25% of passengers walk to the station, respectively.

DCW then continued to the final task of Phase I, the structural evaluation of the historic station. He cautioned that the analysis was only for the concrete slab spanning the tracks, and the columns and girders supporting the slab. The floor slab is in satisfactory condition. The girders, which run between the columns supporting the slab, are in fair to poor condition. The columns are in fair to good condition. All structural elements are in need of some repair, but there is nothing that cannot be fixed.

Overview of Phase II Scope

DCW explained what the consultant team would be doing for the Phase II site evaluation. The team will consider the layout, access, environmental impact, traffic impact, Phase I structural assessment, and historic impact for each alternative. The three alternatives are: (1) reuse of the historic station; (2) use of the historic station parcel with a new structure; and (3) use of the P&W Pawtucket Yard. The criteria by which each alternative will be evaluated fall into three broad categories, including transportation, environmental, and cost and constructability.

Transportation criteria include traffic impacts, accessibility, permanent impact to rail operations, parking supply, ridership, access to opportunity, and consistency with transportation planning policies. Environmental criteria include noise and vibration, air quality, land use compatibility, economic effects, relocations, transit-oriented development opportunities, and environmental justice. Cost & constructability criteria include capital cost, constructability, and temporary impacts to rail operations.

DCW introduced the principles of successful TOD, in order to elaborate on these development opportunities. The principles include developing projects that fit with the community's vision, considering public/private partnerships, providing opportunities for higher density, locating parking away from open view, attempting to create a destination, including retail opportunities, considering mixed use development, integrating bus service into the area, and encouraging housing opportunities. These and other considerations will be evaluated during the TOD analysis. DCW also provided some examples of successful TOD in other parts of the country.

Next Steps

The team will be working on Phase II activities, as well as identifying opportunities for transit oriented development and financing options. After Phase II is completed, the team will begin work on a concept design for the preferred alternative.

Questions

Having completed the presentation, DCW opened the floor to questions and comments:

- It was asked how the future need for environmentally responsible transportation was taken into consideration. DCW explained that projections are based on historic trends and anticipated future development, but that the Federal Transit Authority (FTA) process does not yet include any consideration for increase in cost of gasoline or scarcity of gasoline.
- It was asked when the project would be completed. DCW stated that after completion of the study, the project would enter the FTA project process, which includes four steps. These steps are alternatives analysis, NEPA documentation, final design, and construction agreements. All together the process generally takes 5-6 years before construction begins. Michael D. Cassidy (MDC) noted that the process can be complex, and that funding for construction is not yet available.
- It was asked if a conceptual plan would be produced at the end of this process, and if that plan would include housing. DCW stated that a concept plan will be produced, and that housing could be a part, but that the plan can evolve with the city's needs.
- It was asked if the zoning around the sites was compatible with TOD. MDC stated that as the plan is developed, and public input considered, the city would coordinate the project with the zoning board.
- It was asked if mill conversions had been considered in the project. MDC stated that this would be part of the TOD analysis.
- It was asked if the old Metro Towers project was still viable. MDC stated that projects of that magnitude were driven by federal funding at the time, and that the money for those projects does not exist now, especially for smaller municipalities.
- It was asked if the ridership forecast was all new riders or riders from other stations. DCW stated that about 75% were new riders.
- It was asked how increased ridership would affect congestion on commuter trains. MDC noted that the state of Rhode Island has a contractual agreement with the MBTA to purchase new coaches, and that Pawtucket/Central Falls is a small piece of larger arrangements between the MBTA and Rhode Island.
- It was asked how the costs and advantages of the project compare to other similar projects. DCW stated that the project is located in an area with many 0 or 1 vehicle households, and that the project makes employment in Boston, Providence, and T. F. Green Airport more available to those potential workers.
- It was asked where funding would come from. DCW stated that the FTA typically funds 50% of a project. MDC stated that funds can also come from dedicated allocations in federal transportation acts.
- It was asked how state or local funds would be raised. MDC stated that the state and federal governments would be the most likely funding sources, but that if local money was needed, it would probably be raised through municipal bonds. DCW noted the growth of "creative financing" in transportation projects.
- It was asked if RIPTA was part of the process, and if they viewed the station as potential competition. DCW stated that they are part of the process and view commuter rail projects as a

benefit, not competition. He noted that for South County, RIPTA anticipates adjusting its bus routes to better serve commuter rail stations.

- It was asked if the track curvature at the historic station site represented a serious problem. DCW noted that it is a problem due to the gap between the platform and train, but stated that the team has a platform design that works for that site.
- It was asked if the walk access share considered any contemplated residential conversions in the Conant Street area. DCW stated that they did not, and that the team would consider using a range for the value of walk access share to capture those possibilities. MDC noted that it was better to err on the side of a low value, thereby overestimating the impact on traffic of people driving to the station.
- It was asked if there were serious leaks or hazardous material such as asbestos in the old station building. MDC stated that the current analysis was for the site, not the building. The historic station site could be used for a commuter rail stop with or without the historic station.
- It was asked if the South County service was definite, and if this would affect the schedule or number of trains available to stop at Pawtucket/Central Falls. DCW stated that Airport Station would probably open in 2008-9, and that the state had also committed to Wickford Junction station. Service beyond to Westerly was still only contemplated. MDC noted that this service may or may not be an MBTA service.
- It was asked when the Phase II analysis would be complete, and if there was any site preference. DCW stated that the Phase II analysis would be complete in about a month, and that Phase III would be completed in January 2007. There is no site preference at this point.
- It was asked if the project had a website. Sue Mara stated that presentations, meeting minutes, and other information would be available on the planning department website.
- It was asked if, given the long process schedule, any action could be anticipated regarding the condition of the old building. MDC noted that the historic site is currently in private hands and that the owners are moving forward with their own plans in the interim.

Attachments:

- Sign-In Sheet
- Agenda
- Printout of Powerpoint Slideshow

MD/md

xc: Attendees, File

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

Meeting Attendance Sheet – Public Meeting #2

| Date: October 24, 2006 | | Time: 7:00 PM – 9:00 PM | Location: Visitor's Center 175 Main Street Pawtucket, RI 02860 | | | |
|------------------------|------------------|-------------------------|--|------------------|----------|-------------------------------|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| | Eleanor Flaherty | Resident | 71 Young St | 722-1649 | | ELEANOR FLAHERTY @juno.com |
| | Jane Vitale | Resident | | | | |
| | Paul Keane | Student | 308 Benefit St. Providence | | | Paul.ikezue @gmail.com |
| | Anthony Alant | R/H | 44 Washington St | 457-1103 | 450-1361 | Tavant@RI housing.com |
| | Dylan Berwick | IDENT | 80 OLYMPIA AVE | 755-3040 | | |
| | Debra Sedgwick | Snapo | Weymouth, MA 01901 5558 Refugee Center Hwy | 901327727 | | |
| | Proterding | | 75 Montgomerie St | 3314514 | | qds7@cox.net |
| | Jack Carney | City of Pawtucket | 250 ARMISTICE Bldg. | 728-0500 X236 | | |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

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|------------------------|----------------------------|-------------------------------|--------------------------------------|--|-----|-------------------------|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| | Hegher Saxeas | Pawtucket Foundation | PO BOX 515 Pawtucket, RI 02860 | 729-8300 | 7 | nes@pawtucket |
| | DAN HEALER | P.I. HOUSING | 44 WASH ST | 401 457-1195 | | dhealy@earthlink.net |
| | LINDA DEWING | SELF | 10 Exchange CT # 605 | 727 4700 | | avitalife@earthlink.net |
| | JACK WITSELL | SUPD | P.O. BOX 831058 PORTSLOUGH, RI | 772-475 6030 | | THE WITCH MAC.COM |
| | Andrew Sprigman | | | 728 6590 | | boresalant@aol |
| | David, also Diana Mende | SELF | 10 Exchange CT # 603 Pawtucket | 726 1321 | | demande@superior.net |
| | Marguerite Pile | Bayley St. Loft 4 S (self) | 28 Bayley St | 475-9789 | | mropic@excite.com |
| | | | | | | |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

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|------------------------|----------------|---|---|--|-----|---|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| | John Flaherty | PAWTUCKET RESIDENT/ R.R. EMPLOYEE | 121 POND ST PAWT. RI 02860 | 401-727-2274 | | John Flaherty @netzero-net |
| | RICH DAVIS | PAWTUCKET FOUNDAATION | | 725 4400 | | |
| | River | | | | | Susan@ pawtucketri. net |
| | John Wooster | Brown/RI SD | Box 5628 75 Waterman Providence | | | john-wooster @brown.edu |
| | -Rachel Bates | Resident | 80 olympia Ave | | | ra.bates@ new.edu |
| | Lane Eldenhain | City Council | 31 Hanover ave | 724-7907 | | Pawtucket@denham choicemail.com |
| | Herman H Rose | | 66 Glenwood CR Orchard Dr Hope RI 02831 | 724-9275 | | hermhill @excite.s thehammett@ gmail.com |
| | Kristina Dwyer | The Abrams Group | | 996-2355 | | |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

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|-------------------------------|-----------------|--------------------------------|--------------------|---|-----|---|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| | Nancy Collapser | P.C.D.C. | 423 Jendatale | 727-1357 | | ANACALL O WORLDNET. ATTN: NET. |
| | Arthur Martins | Pawt Police | | 727-9100x716 | | |
| | Betsy Adams | The Times | | 727-9292 | | |
| | Mary Green | | 9 Cropper | 728-8375 | | mmwalker55 @ Verizon.net |
| | Mindy Walker | | 701 Hazel St. | 728-5385 | | twosies @moses4faso. com |
| | Tom Mares | M.A.S. | 170 Washington St. | | | |
| | | | | | | |
| | | | | | | |

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The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

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|-------------------------------|-------------|--------------------------------|------------------------|--|--------------|-----------------------------|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| | John Evers | Self | | | | |
| | BILL HUNT | Foundation | 100 EAST N PAWT R C | 401 722 1185 | 401 728 0320 | whunte shove.com |
| | Nancy White | PCDC | 210 West Ave | 726-1173 Ext 114 | 401 725-3261 | nancy.white@pawtucketri.com |
| | Wynne Riley | Sen. Reed | US Congress | 528-5200 | | clerks-Riley@us.senate.gov |
| | | | | | | |
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The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

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|-------------------------------|-------------------|--------------------------------|--------------------------------------|---|----------|-------------------------------|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| | STEPHEN A RICE | CITY OF PAWT. | 137 Rosewood Ave | 728-0500 x242 | | spicci@pawtkt.com |
| | Shandi Brown | Barton St Neigh. Assoc. | | 726-1173 x118 | | shandi.brown@pawtucketcdc.com |
| | Paul Shadock | City of Pawtucket | Fairbairn St | 722-5300 | 724-3410 | PROV MET @ Act. Com |
| | STEPHANIE FORNINO | BAYLEY STREET LOFTS | 28 Bayley St 505 Pawt RI 02860 | 335-3612 | | Sforanino@yahoo.com |
| | Jim Pierce | " | " | " | | " |
| | | | | | | |
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PAUL J. WILDENHAIN
Councilman District Two

(401) 724-7907
pauljwildenhain@hotmail.com
31 Hanover Avenue
Pawtucket, Rhode Island 02861

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility



Pawtucket/Central Falls Commuter Rail Facility – Public Meeting #2

October 24, 2006

Yonasson Hanger Bravett, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Project Agenda

- Phase I: Train Service Feasibility-Summary
- Phase II: Analysis and Comparison of Two Sites – Progress
- Next Steps

Yonasson Hanger Bravett, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Phase I – Feasibility Analysis: *Is Commuter Rail Service to Pawtucket/ Central Falls Feasible?*

- Operational Analysis
- Ridership Estimates
- Structural Evaluation




Yonasson Hanger Bravett, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Operational Analysis - Considerations

- No adverse impact on existing services
- Amtrak: **no stopping on Mainline**
- MBTA/P&W: **FRIP capacity**
- P&W: **freight clearances**
- MBTA: **schedule impacts**
- RIDOT: **South County service**



Yonasson Hanger Bravett, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

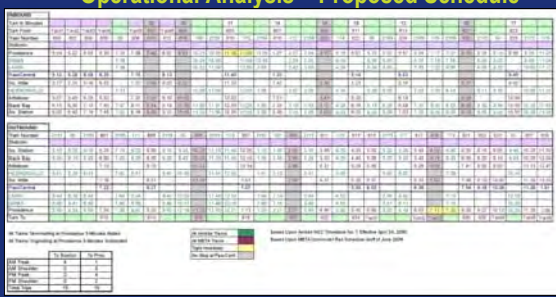
Operational Analysis - Assumptions

- Amtrak Spring 2006 schedule
- MBTA 2006 schedule
- New station stop – 3 minutes
- MBTA turn times – 10 minutes
- Conflicts
 - Scheduled MBTA departure <10 minutes ahead of Amtrak
 - Scheduled MBTA arrival <10 minutes ahead of Amtrak
 - Providence turns <10 minutes

Yonasson Hanger Bravett, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

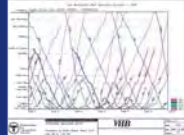
Operational Analysis – Proposed Schedule



Yonasson Hanger Bravett, Inc.

Operational Analysis - Results

- 23 of 30 weekday trips can stop at Pawtucket/Central Falls
- AM Peak – 6 of 7 Inbound trains stop
- PM Peak – 5 of 6 Outbound trains stop
- 2 Outbound trips to Providence (AM Peak)
- 2 Inbound trips to Boston (PM Peak)



Ridership - Assumptions

- 2000 Census
- 2000 Journey-to-Work
- RIDOT Statewide Model
- CTPS Regional Model
- RIPTA Schedules
- MBTA Fare Structure and Schedules



Ridership – Capture Areas



Ridership - Results

- **2030 Daily Boardings**
 - ▷ To Boston: 1100
 - ▷ To Providence: 250-550
 - ▷ To T.F. Green: 150-170
- **Access**
 - ▷ Park: 64%-74%
 - ▷ Kiss and Ride: 13%
 - ▷ Transit: 1%
 - ▷ Walk: 11%-23%



Structural Evaluation

- **Floor slabs**
 - ▷ Satisfactory condition
- **Girders**
 - ▷ Fair to poor condition
- **Columns**
 - ▷ Fair to good condition



Phase II – Site Conditions Analysis: Which of the Two Sites Provides the Best Opportunities?

- **Site Evaluations**
 - ▷ Layout
 - ▷ Access
 - ▷ Environmental
 - ▷ Traffic
 - ▷ Phase 1 Site Assessment
 - ▷ Historic Evaluation



Site Conditions Analysis – Evaluation Criteria

■ Transportation

- ▷ Traffic impacts
- ▷ Accessibility
- ▷ Impact on Rail Operations
- ▷ Parking Supply
- ▷ Ridership
- ▷ Access to opportunity
- ▷ Consistency with Transportation Planning and Policies



Site Conditions Analysis – Evaluation Criteria

■ Environmental

- ▷ Noise & Vibration
- ▷ Air Quality
- ▷ Compatibility with Land Use
- ▷ Economic Effects
- ▷ Relocations
- ▷ TOD opportunities
- ▷ Environmental Justice



Site Conditions Analysis – Evaluation Criteria

■ Cost and Constructability

- ▷ Capital Cost
- ▷ Constructability
- ▷ Impacts on Rail Operations (during construction)



Transit-Oriented Development Analysis

■ Principles of Successful TOD

- ▷ Work with the community's vision
- ▷ Consider public/private partnerships
- ▷ Offer opportunities for higher densities
- ▷ Locate the parking strategically
- ▷ Create a destination
- ▷ Offer retail opportunities
- ▷ Consider mixed uses in the area
- ▷ Offer the ability to integrate buses
- ▷ Encourage housing opportunities

Next Steps

- Concept Design/Evaluation of Alternative Sites
- Transit-Oriented Development
- Project Financial Evaluations
- Concept Design for Preferred Alternative

Public Meeting #2

**October 24, 2006
7PM – 9PM**

**La segunda reunión publica se
llevará a cabo el martes,
24 de octubre del 2006
7PM – 9PM**

Agenda

- Introductions
- Status of Study
- Phase I: Train Service Feasibility- Summary
- Phase II: Evaluation of Two Sites - Progress
- Next Steps
- Public Comment Period

Agenda

- Introducciones
- El estado del Estudio
- Fase 1: Posibilidad de reestablecer el servicio de trenes - resumen
- Fase 2: La evaluación de dos sitios – progreso
- Próximas fases
- Período de comentario público



Meeting Notes

Attendees: See Attached Sign-In Sheet

Date/Time: February 13, 2007; 7:00 PM

Project No.: 09736.00

Place: Visitor's Center, 175 Main
Street, Pawtucket, RI 02860

Re: Pawtucket/Central Falls Commuter Rail
Facility Feasibility Study and Site Analysis
Public Committee Meeting #3

Notes taken by: M. Dixon

The purposes of the third public meeting were to introduce the results of the second phase of the project; provide an overview of the scope of services and schedule for the third phase; and discuss the development of the preferred alternative. A copy of the agenda and PowerPoint presentation is attached for reference.

Phase II Concepts

Introductions were made by Michael D. Cassidy (MDC), Director of Planning and Redevelopment for the City of Pawtucket.

David C. Wilcock (DCW), VHB Project Manager, provided an update on the project status. The first two phases of the project have been completed, including concept designs of each alternative, evaluation and screening of alternatives, and ratings and rankings of alternatives.

DCW introduced the concept design criteria. The various elements of a commuter rail station in Pawtucket/Central Falls are subject to the design criteria and guidelines of Amtrak, the Massachusetts Bay Transportation Authority (MBTA), Rhode Island Department of Transportation (RIDOT), the American Association of State Highway and Transportation Officials (AASHTO), and the Providence and Worcester Railroad (P&W).

DCW explained that there are two basic alternatives for the historic station site located on Broad Street: access via the historic station building; and access via a new headhouse at or near Clay Street. He introduced Alternative 1 - Historic Station Site with Access from the Historic Station Building. The concept plan was shown and explained in detail. Primary access would be via the station building, with secondary access from Jenks Street or Cross Street. Elevators would be located in the existing freight elevator shafts. Parking for 700-750 cars would be provided in a garage with about 105-135 spaces per floor. Platforms would begin near Clay Street and run north, and be connected to the station by a fenced walkway adjacent to the railroad tracks.

DCW then proceeded to introduce Alternative 2 - Historic Station Site with Access from Clay Street. The concept plan was shown and explained in detail. Primary access would be via the Clay Street bridge, with secondary access from Jenks Street or Cross Street. Elevators would be located at Clay Street. A garage would be provided as described in Alternative 1. Platforms would begin near Clay Street and run north, in the same location as shown in Alternative 1. DCW noted that the concept shows the headhouse occupying the existing Clay Street bridge. Central Falls has expressed some

reservations regarding this location for the headhouse. DCW noted that the headhouse could be moved to either the north or south side of the Clay Street bridge.

DCW introduced Alternative 3 – PWRR Pawtucket Yard Site. The concept plan was shown and explained in detail. Primary access would be via the intersection of Goff Avenue and Pine Street, with secondary access from Conant Street. Parking for 700-750 vehicles would be provided by a combination of a surface lot and a structure. Vehicular access would be only from the intersection of Goff Avenue and Pine Street.

Evaluation Methodology

DCW introduced the evaluation methodology used to screen and rank the alternatives. Alternatives were ranked against the screening criteria in an absolute with ratings are from -10 to +10, in increments of 5. DCW recapped the evaluation criteria, as introduced in the October 24, 2006 public meeting. DCW then introduced the ratings and rankings table. The process of ranking each alternative was explained, and detailed examples of the scoring for several criteria were described.

Project Costs

DCW proceeded to introduce conceptual costs for the project. Capital costs are estimated to be \$25-\$50 million, with incidental costs up to \$35 million, and operations and maintenance costs of approximately \$0.8-\$1.0 million annually.

Next Steps

Phase III activities will include a concept design for the preferred alternative, a more detailed transit-oriented development analysis, and financial evaluations.

Questions

Having completed the presentation, DCW opened the floor to questions and comments:

- It was asked if the garage could be delayed at the P&W yard site, thereby deferring some of the project cost. MDC stated that the garage could be phased at the P&W yard, depending on ridership. DCW noted that a phased garage could be constructed at either site.
- It was asked if future conversion of mill buildings into residential uses was considered in the scoring, or if scoring took future impact of development into consideration. MDC noted that there are old mill buildings within ¼ mile of both sites, but that the historic site is accessible from all sides, while the P&W yard site is not.
- It was noted that a large parking structure could be unsightly. MDC stated that discussions with Central Falls have raised the possibility of spreading the parking around to several sites at the historic depot site location on Broad Street, thereby reducing the height needed for a parking structure.
- It was asked if there was a deadline on the evaluation process. MDC stated that this study is expected to complete by June 2007. At that time, the project would proceed into the National Environmental Policy Act (NEPA) documentation step. DCW stated that this current study is designed to roll into the NEPA process. This project will probably require an Environmental Assessment (EA), which generally takes 12-15 months to develop. After NEPA approval, the project would enter final design, so construction would probably not begin until after 2010. MDC stated that the project team is working diligently to take advantage of this opportunity. The team understands the public's frustration when desired projects advance slowly, but the team needs to make sure that it complies with the requirements of all the applicable federal and state processes.

- It was asked if the team had considered working with Bonanza Bus Lines, a Rhode Island company, to provide bus service to Boston rather than commuter rail. Bonanza already runs 17 trips per day from Providence to Boston and might be able to operate the service in a more cost-effective manner. MDC noted that many residents already take the MBTA to Boston, parking in South Attleboro. A recent Massachusetts Executive Office of Transportation (EOT) study showed that 90% of the cars parked in South Attleboro are registered in Rhode Island. He noted the increasing demand for commuter rail, especially with increasing congestion on I-95. Trains already operate through Pawtucket/Central Falls, so there is little, if any, additional operating cost to stop trains at a new station. Lastly, he noted that Warwick Station will open in a few years, with service to South County expected not long after that, and that linking Pawtucket/Central Falls to this growing Rhode Island commuter rail network would greatly increase mobility.
- It was asked what uses would occupy the remainder of the historic station building under Alternative 1. MDC stated that it would be commercial or retail development.
- It was asked if this was the end of concept design. MDC stated that the next phase of the project will include refinement of the concept design for the preferred alternative.
- It was asked how the owner of the historic station site felt about the commuter rail station project. MDC noted that redevelopment of the commuter rail station will help any future retail use on site.
- It was noted that the building might be in very poor condition if another 15 years elapse prior to implementation of the commuter rail stop. MDC stated that reuse of the building needn't wait that long, and that the City is working with the owner to develop a plan for the building.
- Clarification concerning capital costs was requested. MDC stated that the \$35 million in incidental costs are related to the P&W yard site, and that the historic site would not incur incidental costs nearly as large.
- It was asked how many daily riders were expected. DCW state that about 1100 riders were expected every day by 2025.
- It was asked how difficult relocation of the P&W yard would be. MDC stated that it would be difficult to find a large enough site adjacent to an active rail line nearby that could be designed, permitted, and constructed without significant opposition.
- It was asked if both alternatives had station stops on the mainline tracks, and what the course of action would be if Amtrak refused to allow mainline stops. DCW stated that both alternatives feature mainline stops, and that Amtrak's position to not allow mainline stops could curtail the project. The MBTA does not support the concept of station sidings for this commuter rail stop. The MBTA also has concerns about using the Freight Rail Improvement Project track as a single track link between Pawtucket and Providence. The MBTA would prefer to operate the service with mainline stops. DCW noted that construction of station sidings would significantly increase the cost for either alternative. MDC noted that Amtrak's position was not a formal policy, and that it is possible that the new president of Amtrak may not continue this position.
- It was asked when the team would meet with the railroads and determine how these issues could be addressed. DCW stated that the team has met with all the railroad interests, and that the team hopes to have a resolution of most railroad issues by the end of the study. MDC stated that over the next 6 months, the team would work with the railroads and RIDOT to come to mutually acceptable arrangements.
- It was asked if comparison to the timeline of Warwick Station was fair, given the considerable support for redevelopment of the historic station site. MDC stated that no commuter trains were running previously in Warwick, making that a more complicated project.
- Clarification concerning the term "headhouse" was requested. DCW explained that a headhouse is a simple access building, including stairs and elevators to the platforms. He stated that it did

not need to be located at Clay Street as shown in Alternative 2; the headhouse could be moved north or south as desired.

- It was asked why the whole historic building could not be dedicated to railroad purposes. MDC explained that when the station was constructed, railroad stations functioned like modern airports, handling significant amounts of luggage and freight, and providing passenger amenities such as restaurants and large waiting areas. The majority of demand today is for commuter services, and commuters do not need as much space because they are only traveling a short distance. Therefore, it makes economic sense to redevelop the station for commercial and retail uses.
- It was asked if the headhouse could be part of the garage structure. MDC and DCW stated that the garage and headhouse could be part of the same structure, but that from a retail perspective it is desirable to have passengers walk through the station building or other development on their way to the platform.

Attachments:

- Sign-In Sheet
- Agenda
- Printout of Powerpoint Slideshow

MD/md

xc: Attendees, File

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

Meeting Attendance Sheet – Public Meeting #3

| Date: February 13, 2006 | | Time: 7:00 PM – 9:00 PM | Location: Visitor's Center 175 Main Street Pawtucket, RI 02860 | | | |
|--------------------------------|------------------|--------------------------------|---|--------------|------------|---------------|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| | Tom Moses | Warwick RIS | | | | |
| | Oscar Sealbinder | ✓ | 5858 Ridgeway Ct - Pawtucket Warwick, RI | | | |
| | Debra Corral | | 370 Broadway | 722-2800 | | |
| | Nancy White | bcdc | 210 West Ave | 726-1173 | | |
| | Peter Dawson | myself | 175 Montquarry St | 331 4514 | | |
| | JCB and | myself | 75 Montquarry St | 331-4514 | | |
| | Dan R | City Council | 127 Revere St | 723-2597 | | |
| | Heather Amey | Pawtucket Foundation | | 729-8300 | | |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

Meeting Attendance Sheet – Public Meeting #3

| Date: February 13, 2006 | | Time: 7:00 PM – 9:00 PM | | Location: Visitor's Center 175 Main Street Pawtucket, RI 02860 | | |
|-------------------------|---------------------|-------------------------------------|---------------------------|--|----------|-----------------------------|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| | Nancy Callaghan | P. C. D. C. | 423 Lonsdale | 401-722-1359 | | |
| | Shandi Brown | Barton Street Neighborhood Assoc | 210 West Ave Pawtucket | 401-726-1173 x118 | | |
| | LEONARD ELWIN | ART TRAIL | | 617 345-7301 | | |
| | ARI HECKMAN | CORNISH ASSOC | 414 BARNUM ST PROV, RI | 401 431 9982 | | ari-heckman @comcast.net |
| | ROBERTO | | 15 EXCHANGE CT PAW | | | |
| | JONATHAN STEWENS | PRESERVE RI | N. MAIN PROV 02904 | 272-5101 331 | | J STEWENS @PRESERVE RI |
| | Jackie Delata | Congressman Kennedy | | | | |
| | TONY ANDRABOIS | BONANDA BUS LINES | 1 BONANDA WAY | 331-7500 | 331-7537 | THANDRA-E PETA@PMBUS.COM |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

Meeting Attendance Sheet – Public Meeting #3

| Date: February 13, 2006 | | Time: 7:00 PM – 9:00 PM | | Location: Visitor's Center 175 Main Street Pawtucket, RI 02860 | | |
|-------------------------|------------------------|-------------------------|---------------------------------------|--|----------|--------------------------------|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| | Ricko KATAMAKI self | | Gmenting St Prout | 724/0175 | 213/07 | |
| | Jenni Katagamaki | | 1 Fulton St, #405 Providence 02903 | 837-4472 | | katagamaki@ gmail.com |
| | Yvonne Seggerman | Gamm Theatre | 170 Exchange St | 723-4266 | 723-3140 | yesogammtheatre.org |
| | BUFF CHACE | Cornish Assoc | 46 Aborn St Providence | 421-0254 | | BUFFCHACE@ CORNISHRI.COM |
| | MAIA SMALL | TSA | 1000 566 MINERAL SPRING | 401 310-5708 | | maia@ Thevlar-small.com |
| | JOE HARKET | Pawtucket RESIDENT | 165 Broad St | 421 7518 | - | shayw@ Thevlar-small.com |
| | Cliff Wood | Cornish Assoc | | 421- 20254 | | cliff-wood@ cornishpram.com |
| | Windy Walker | | | | | |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

Meeting Attendance Sheet – Public Meeting #3

| Date: February 13, 2006 | | Time: 7:00 PM – 9:00 PM | Location: Visitor's Center 175 Main Street Pawtucket, RI 02860 | | | |
|--------------------------------|----------------|--------------------------------|---|---|-------------------------------------|--------------------------------|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| | George Johnson | RI. Statewide Planning | One Chingwood Hill Prov. RI 02908 | 222-6490 | 222-2083 | SJohnson@planning.state RI.US. |
| | Ed Fetzner | Mayor at-large | City hall. | | | |
| | Frank D'Amico | BUSINESS | ONE BOWEN ST PROVIDENCE R.I. | 401-504-2439 401-331-7820 EXT 204 | Frank-D @ DETAIL PLAN BUS.COM | 401-331-7537 |
| | D E Stark | PST | 19 KENNEDY ST PROV | 729 0537 | 729-5349 | bestank@costa.net |
| | NG Galt | none | 9 John St | 121-9834 | — | — |
| | Mike Mawie | Two Town Inc | 49 Winstonsay 02960 | 729-9500 | | |
| | | | | | | |
| | | | | | | |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

Meeting Attendance Sheet – Public Meeting #3

| Date: February 13, 2006 | | Time: 7:00 PM – 9:00 PM | | Location: Visitor's Center 175 Main Street Pawtucket, RI 02860 | | |
|-------------------------|----------------|-----------------------------|-----------------------------------|--|------------------|----------------------------|
| X | Name | Representing | Address | Phone | Fax | E-mail |
| | Bon Wierks | Urban Smart Growth | 1005 Main St Pawtucket, RI | 401 722-0752 | 401 722-0754 | BonW@urban-smart.org |
| | Rick Goldstein | CITY CLERK PAWTUCKET | 137 ROXBURY AVE PAWT | 401-728- 0500 X 225 | 401- 728-8932 | rgoldstein@pawtucketri.com |
| | Eric Sheehan | LISC | 229 Waterman St Prov. RI 02900 | 401-371-0131 | 401-866-6699 | esheehan@lisc.org |
| | Arch Davis | THE PAWTUCKET FOUNDATION | 67 PARK PLACE 02860 | 401 729 4400 | 729 8111 | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
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Public Meeting #3

**February 13, 2007
7PM – 9PM**

Agenda

- Introductions
- Status of Study
- Concept Designs
- Screening and Ranking of Alternatives
- Next Steps
- Public Comment Period

**La segunda reunión publica se
llevará a cabo el martes,
13 de febrero del 2007
7PM – 9PM**

Agenda

- Introducciones
- El estado del Estudio
- El concepto diseñá
- La investigación y Situar de Alternativas
- Próximas fases
- Período de comentario público



Pawtucket/Central Falls Commuter Rail Facility – Public Meeting #3

February 13, 2006

Yonasson Hargens Brantley, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Project Agenda

- Overall Project Status
- Concept Designs
- Screening and Ranking of Alternatives
- Next Steps

Yonasson Hargens Brantley, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Project Status to Date

- Phase I Analysis Completed
- Concept Designs of Alternatives
- Evaluation Methodology for Screening Alternatives
- Screening Criteria
- Ratings and Rankings

Yonasson Hargens Brantley, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Concept Designs - Design Criteria

- Amtrak
- MBTA
- PWRR
- AASHTO
- RIDOT



Yonasson Hargens Brantley, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Concept Design – Historic Station Site

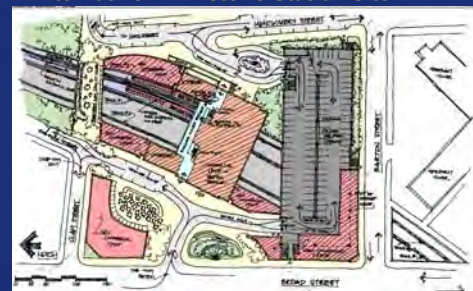
- Alternative 1 – Access from Historic Station Building
- Alternative 2 – Access from Clay Street



Yonasson Hargens Brantley, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Alternative 1 – Historic Station Site



Yonasson Hargens Brantley, Inc.

Alternative 1 – Historic Station Site

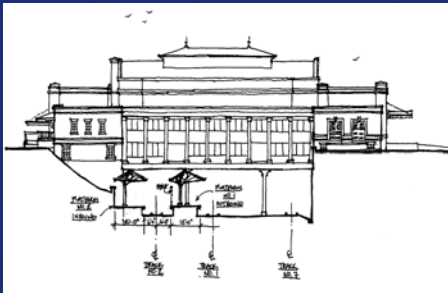
- Access from existing historic station building
- Secondary access from Jenks and/or Cross Street
- Platforms serve Tracks 1 and 2
- Elevators in existing elevator shafts
- Parking garage - 105 spaces/floor



Alternative 2 – Clay Street Access



Alternative 2 – Section



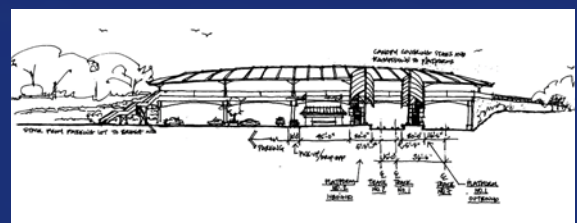
Alternative 2 – Design Features

- Primary access from Clay Street
- Secondary access from Jenks and/or Cross Streets
- Platforms serve Tracks 1 and 2
- Elevators to platforms in new elevator shafts from Clay Street
- Parking garage - 105 spaces/floor

Alternative 3 – PWRR Railyard Site



Alternative 3 – PWRR Railyard Site



Concept Design – PWRR Railyard Site

- Access intersection of Goff and Pine Streets
- Secondary access from Conant Street
- Platforms serve Tracks 1 and 2
- Surface parking for 250 spaces



Screening and Ranking of Alternatives

- Methodology
 - ▷ Compare to Screening Criteria
 - ▷ Ratings are absolute, not relative
 - ▷ Ratings: -10 to +10, in increments of 5

Screening Criteria

- **Transportation**
 - ▷ Traffic impacts
 - ▷ Accessibility
 - ▷ Impact on Rail Operations
 - ▷ Parking Supply
 - ▷ Ridership
 - ▷ Access to opportunity
 - ▷ Consistency with Transportation Planning and Policies



Screening Criteria

- **Environmental**
 - ▷ Noise & Vibration
 - ▷ Air Quality
 - ▷ Compatibility with Land Use
 - ▷ Economic Effects
 - ▷ Relocations
 - ▷ TOD opportunities
 - ▷ Environmental Justice



Screening Criteria

- **Constructability**
 - ▷ Constructability
 - ▷ Impacts on Rail Operations (during construction)
 - ▷ Business Relocations



Ranking of Alternatives - Ratings

- 10: Strongly exhibits negative characteristics for that criterion
- 5: Exhibits some negative characteristics for that criterion
- 0: Neutral or does not have a noticeable impact for that criterion
- + 5: Exhibits some positive characteristics for that criterion
- + 10: Strongly exhibits positive characteristics for that criterion

Rating and Ranking of Alternatives

| | Historic Station Site | P&W Yard Site |
|---|-----------------------|---------------|
| Transportation | | |
| Traffic impacts | -5 | -5 |
| Accessibility | 10 | 5 |
| Impact on railroad operations (permanent) | 0 | 0 |
| Parking supply | 5 | 5 |
| Recreation | 5 | 5 |
| Access to opportunity | 10 | 5 |
| Consistency w/ transportation policies | 5 | 5 |
| Environmental | | |
| Hazardous materials | -5 | -10 |
| Noise and vibration | 0 | 0 |
| Air quality | -5 | -10 |
| Compatibility w/ land use | 10 | 5 |
| Economic impact | 5 | 5 |
| TOD opportunities | 5 | 5 |
| Environmental justice | 5 | 0 |
| Constructability | | |
| Constructability | -5 | 0 |
| Impact on railroad operations (temporary) | -10 | -5 |
| Business relocations | -5 | -10 |
| Total Score | 25 | 0 |

Range of Costs

| | |
|--|-----------------------------|
| Capital Costs (Station/Track) | \$25 million - \$50 million |
| O&M Costs (Annual) | \$800,000 - 1,000,000 |
| Incidental Costs (Real Estate, Relocations) | Up to \$35 million |

Next Steps

- Concept Design for Preferred Alternative
- Transit-Oriented Development Analysis
- Project Financial Evaluations



Meeting Notes

Attendees: See Attached Sign-In Sheet

Date/Time: June 7, 2007; 7:00 PM

Project No.: 09736.00

Place: Visitor's Center, 175 Main
Street, Pawtucket, RI 02860

Re: Pawtucket/Central Falls Commuter Rail
Facility Feasibility Study and Site Analysis
Public Meeting #4

Notes taken by: M. Dixon

The purpose of the fourth public meeting was: to introduce the results of the third phase of the project including 10% concept design for the preferred site, financial analysis, and transit-oriented development (TOD) analysis; to provide an overview of the planning for implementation; and to give a brief summary of the project next steps. A copy of the agenda is attached for reference.

Introduction and Project Findings to Date

Introductions were made by Michael D. Cassidy (MDC), Director of Planning and Redevelopment for the City of Pawtucket.

David C. Wilcock (DCW), VHB Project Manager, explained that the VHB Team had substantially completed activities for all three phases of the study. He proceeded to summarize the project findings to date:

- Phase I: It is operationally feasible to stop 23 of the 30 existing MBTA trains that pass through Pawtucket/Central Falls every weekday.
- Phase II: The historic depot location is the preferred site for a new commuter rail facility.

Neighborhood Outreach and Expanded TOD Analysis

DCW introduced the results of the neighborhood outreach and expanded transit-oriented development (TOD) analysis. The purpose of the outreach and analysis was to better understand neighborhood concerns and priorities, and to familiarize the neighborhood with examples of TOD.

At the first workshop, residents and business owners saw a presentation of TOD case studies and participated in round table discussions of neighborhood issues. The second workshop was held in an open house format, with information booths on traffic and parking, historic station reuse, commuter rail stop, housing and neighborhood update, and safety/lighting. TOD case studies were also presented.

The outreach revealed that top community priorities are housing affordability and neighborhood focus concerning investment of funds, followed by economic development, pedestrian environment concerns, status of the historic station building, community amenities, and driving environment

concerns. The team learned which locations the community considers to be congested, including the Broad Street corridor from Fales Street to Clay Street and the Exchange Street corridor from Dexter Street to Broad Street. The team also learned that the community considers parking to be problematic in the area of the Broad Street & Barton Street intersection, as well as on Montgomery Street near the historic station site.

10% Concept Design and Cost Estimate

DCW introduced the 10% concept design for a commuter rail stop at the preferred site - the historic station site. The concept plan, included as an attachment to these notes, was shown and explained in detail. Platforms would be located between Clay Street and Pacific Street on the outside of the tracks (between Tracks 1 and 7 outbound, between Track 2 and the edge of the right-of-way inbound). Platforms will be full 800-foot high-level platforms, including ADA ramps, canopy, lighting, electronic signs, and other amenities.

DCW explained that key features of the design were flexibility in the location of access points from the street to the platforms and flexibility in the location and size of parking facilities. Primary platform access, featuring stairs and elevators, is to be located at the southern end of the platforms. Secondary access could be provided in the vicinity of Jenks Street, Cross Street, Central Street, and/or Pacific Street. Several potential locations for small surface parking lots were presented. Several examples of basic commuter rail stop infrastructure to help people understand the contemplated facility were presented as well.

DCW proceeded to explain that the flexibility of the design allowed for several investment scenarios, as follows:

1. Commuter Rail Stop – Jenks Street: commuter rail stop with primary platform access near Jenks Street
2. Commuter Rail Stop – Clay Street: commuter rail stop with primary platform access near Clay Street and/or the historic station site; southern end of platform access near northern end of historic station building. The portion of platform south of Clay Street would not be used for boarding, due to the curvature and superelevation of the track in that location.
3. Commuter Rail Stop and Station Development: commuter rail stop with primary platform access at the historic station building; southern end of platform access near northern end of historic station building. The portion of platform south of Clay Street would not be used for boarding, due to the curvature and superelevation of the track in that location. This option also includes reuse of the station, construction of a parking garage, and additional street-level retail.

DCW further explained that construction of the Commuter Rail Stop – Jenks Street or Commuter Rail Stop – Clay Street alternatives would not preclude the construction of Station Redevelopment amenities at a later date.

DCW introduced the capital costs and operations and maintenance costs for each investment scenario. The capital costs (including contingencies and add-ons in 2007 dollars) are estimated as follows: Commuter Rail Stop – Jenks Street, \$23,900,000; Commuter Rail Stop – Clay Street, \$32,600,000; and Commuter Rail Stop and Station Redevelopment, \$69,700,000. The yearly operations and maintenance costs are estimated as follows: Commuter Rail Stop (Jenks Street or Clay Street), \$83,000; and Commuter Rail Stop and Station Redevelopment, \$1,491,000. Yearly revenues from parking and retail leases for each scenario are as follows: Commuter Rail Stop (Jenks Street or Clay Street), \$60,000; and Commuter Rail Stop and Station Redevelopment, \$1,100,000.

Financial Analysis

DCW then presented the results of the financial analysis. The funding scenario for the Commuter Rail Stop – Jenks Street and Commuter Rail Stop – Clay Street was assumed to be an 80/20 federal/state split, while a 40/60 federal/state split was assumed for the Commuter Rail Stop and Station Redevelopment alternative. The Commuter Rail Stop – Jenks Street financing scenario would add \$3,400,000 in financing costs, the Commuter Rail Stop – Clay Street financing scenario would add \$4,700,000 in financing costs, and the Commuter Rail Stop and Station Redevelopment financing scenario would add \$30,100,000 in financing costs.

Summary of Project Findings

DCW recapped the summary of project findings:

- Phase I: 23 out of 30 MBTA trains that pass through Pawtucket/Central Falls every weekday could stop at a new commuter rail facility.
- Phase II: The historic depot site is the preferred site for a new commuter rail facility.
- Phase III: A commuter rail stop can be built to serve Pawtucket/Central Falls for \$25-\$30 million.
- Phased implementation plan can help support economic development.
- Traffic and parking issues can be addressed.
- \$25 million capital project is doable.

Implementation and Next Steps

DCW explained that the study is drawing to a conclusion, and that the final report will be completed by the end of June. To advance the project, the next step is to discuss operations with railroad stakeholders in detail, in order to work out agreements concerning the development of a commuter rail stop on the line. After this is complete, the project can proceed to NEPA documentation, design, and construction.

Public Comment

The floor was opened to public questions and comments:

- It was asked how the project timeline for the commuter rail stop only alternatives compared to the timeline (approximately 7-9 years) presented at the previous public meeting. It was stated that the timeline would be roughly the same, but with fewer hurdles. The timeline depends on political forces as well as engineering and planning. A conservative estimate would be 6-12 months for railroad negotiations, 15 months for National Environmental Policy Act (NEPA) process, 18-24 months for design, and 24 months for construction.
- It was noted that the project schedule would also be affected by the availability of state funding. The state must advance the commuter rail stop, but the cities can proceed with activity on the historic site independent of the stop.
- It was asked if residents could be sure that the cities would advocate on behalf of the project. It was stated that the cities would begin political advocacy at the state and federal level.
- It was asked when Section 106, which pertains to the preservation of historic structures, would be addressed. It was stated that this process is part of NEPA.

- It was asked if bridge modifications were included in the cost estimates. It was stated that the cost was included, and that the cost was based on the assumption that the east abutment of the bridges affected by platform construction would need to be relocated towards the east.
- It was asked if the cost of environmental permitting and engineering design was included in the cost estimates. It was stated that the cost was included, and that the funding for these activities would likely need to come from the state or federal government.
- It was asked if the environmental review conducted as part of this study would be usable for NEPA work. It was stated that the current study followed the FTA model so that much work could be used for NEPA. Traffic counts may need to be updated.
- It was asked how the public could help advocate for the project. It was stated that the cities would invite the public to participate to help lobby on the project's behalf.
- It was asked if PWRR had any issues with the proposed platforms. It was stated that the platforms would be constructed to serve Tracks 1 and 2, not Track 7, where freight service operates. If commuter rail service were implemented on the PWRR line, a platform could be constructed to serve Track 7 in the future.
- It was stated that the platforms in the proposed design are entirely within Central Falls. It was noted that the platforms, even when they extend all the way to the north face of the historic station building, were always proposed to be entirely within Central Falls. Regardless of the actual location, both communities will benefit from the commuter rail stop.
- It was asked why the state match varied from 20%-60%. It was stated that the Federal Transit Administration (FTA) requires a higher percentage match for larger projects.
- It was asked if the South Coast Commuter Rail or Attleboro Station projects would compete with the Pawtucket/Central Falls project for funding. It was stated that these projects do not compete with Pawtucket/Central Falls, as they are located in Massachusetts. Rhode Island has already initiated work on Warwick and Wickford Junction stations; it is the intent of the Pawtucket/Central Falls team to be next after these stations. RIDOT has an existing agreement with the MBTA that would govern the implementation of service at Pawtucket/Central Falls.
- It was noted that the commuter rail stop only alternatives would be very competitive.
- It was asked when the most recent ridership estimate was done. It was stated that the estimate was done in 2006, and projected to 2030.
- It was asked if the ridership estimate included any anticipated shift of commuters from South Attleboro Station to Pawtucket/Central Falls Station. It was stated that this shift was included in the ridership estimate.

Attachments:

- Sign-In Sheet
- Agenda
- Printout of PowerPoint Slideshow

MD/md

xc: Attendees, File

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

Meeting Attendance Sheet - Public Meeting #4

| Date: June 7, 2007 | | Time: 7:00 PM - 9:00 PM | Location: Visitor's Center 175 Main Street Pawtucket, RI 02860 | | |
|---------------------------|------------------|---|---|--------------|---------------------------------|
| X | Name | Representing | Address | Phone | E-mail |
| X | ROCH DAVIS | PAWTUCKET FOUNDATION | | 725- 4400 | |
| | Math Hertel | Woodlawn CDC Woodlawn Community Center | 210 West Ave | 475-7632 | mhertel.woodlawncdc@gmail.com |
| | Pam Sitarz | PAGE CARP | 8 Blackburn Valley Lincoln | 334-4100 | psheini1@pacarcorp.com |
| | Mike Spellill | Self | 201 Don Ave E. Prov RI | 434-1711 | msheer@DOT.RI.GOV |
| | Marguerite Pile | Self | 28 Bayleg Pawtucket | 475-9789 | mropole@excite.com |
| | Patricia Mcalpin | Blackstone Valley Tourism Resident | 123 Cottage St Pawtucket RI | 725-2750 | patricia.mcalpin@yahoo.com |
| | JOE HASKETT | CITIZEN | 165 Broad ST. | 475-7514 | jhaskett@gmail.com |
| | Fred Ordonez | Progreso Latino | 626 Broad | 728-5920 | wordonez@ progresolatino.org |

Pam Sitarz

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

Meeting Attendance Sheet – Public Meeting #3 4

| Date: June 7, 2007 | | Time: 7:00 PM – 9:00 PM | | Location: Visitor's Center 175 Main Street Pawtucket, RI 02860 | |
|--------------------|-----------------------|-------------------------|------------------------------|--|-------------------------------|
| X | Name | Representing | Address | Phone | E-mail |
| | Lee Whiting | Planning & Dev. | 545 E. W. Rte. | 724-4664 | |
| | Jack Mitchell | Supv. | W. Main St. | 772- | THE MITCH@MAC.COM |
| | CHAMELUSKY DAVID | Planning & Dev. | 561 ALAN DR. | 475-6032 | |
| | Braden Dow SIMPSON | Self | 75 Montague St | 529-9319 | ads7@cox.net |
| | NEL VERT | PRV. | 155 MASS. AVE. BOSTON, MA | 617-267-6408 | |
| | Nancy Callaghan | P.C.D.C. | | 722-1357 | NANCA@WORLDNET.ATT.NET |
| | Nancy White | P.C.D.C. | 210 West Ave | 726-1173 | nancywhite@pawtucketcdc.com |
| | Shandi Brown | BSNA | 210 West Ave | 726-1173 x18 | shandi.brown@pawtucketcdc.com |

Public Meeting #4

**June 7, 2007
7PM – 9PM**

Agenda


- Introductions
- Status of Study
- Concept Design
- Transit Oriented Development Analysis
- Next Steps
- Public Comment Period

**La segunda reunión publica se
llevará a cabo el jueves,
7 de Junio del 2007
7PM – 9PM**

Agenda

- Introducciones
- El Estado del Estudio
- El Diseño Conceptual
- Análisis del Desarrollo con Énfasis en Tránsito
- Próximas fases
- Período de comentario público

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility



Pawtucket/Central Falls Commuter Rail Facility – Public Meeting #4

June 7, 2007

1000 Henshaw Engineers Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Meeting Agenda


- Project Findings to Date
- Neighborhood Outreach and Expanded Transit-Oriented Development Analysis
- Concept Design for Commuter Rail Stop
- Financial Analysis
- Planning for Implementation

1000 Henshaw Engineers Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Project Findings To Date

- Phase I Finding – 23 out of 30 MBTA trains that pass through Pawtucket/Central Falls today could stop at a new commuter rail facility
- Phase II Finding – The historic depot location is the preferred site for a new commuter rail facility




1000 Henshaw Engineers Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Neighborhood Outreach and Expanded TOD Analysis

Purpose:

To better understand neighborhood concerns and identify priorities.




1000 Henshaw Engineers Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Neighborhood Outreach and Expanded TOD Analysis

Workshop 1 May 10th:

- Presentation of TOD Case Studies
- Roundtable discussions of neighborhood issues



1000 Henshaw Engineers Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

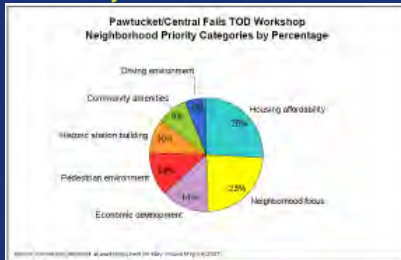
Neighborhood Outreach and Expanded TOD Analysis

Workshop 2: Open House May 24th:

- Traffic and Parking
- Old Train Station Reuse
- Commuter Rail Stop
- Housing and Neighborhood Update
- Safety/Lighting
- TOD Case Studies

1000 Henshaw Engineers Associates, Inc.

Neighborhood Outreach and Expanded TOD Analysis



Neighborhood Outreach and Expanded TOD Analysis



Neighborhood Outreach and Expanded TOD Analysis



Concept Design – Commuter Rail Stop

Platforms to be located between Clay Street and Pacific Street



Concept Design – Commuter Rail Stop

- Two 800 foot long high level platforms
- ADA compliant access between the street and the platforms
- Canopy, lighting
- Electronic signs
- Other amenities



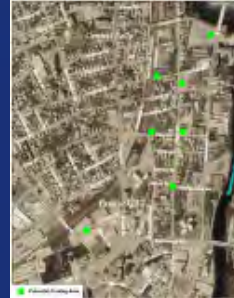
Concept Design – Commuter Rail Stop



Concept Design – Commuter Rail Stop

- Primary access at south end of platforms
- Flexible access points:
 - Vicinity of Clay Street/Jenks Street
 - Jenks Street or Cross Street
 - Central Street or Pacific Street
- Flexible parking locations:
 - Opportunity for smaller surface lots

Concept Design – Commuter Rail Stop



Concept Design – Commuter Rail Stop



Amtrak/MBTA Route 128 University Park Station

Concept Design – Commuter Rail Stop



CDOT/MNR New Haven Line - Greenwich

Concept Design – Commuter Rail Stop



CDOT/MNR New Haven Line - Greenwich

Concept Design – Commuter Rail Stop



VRE Fredericksburg Line - Rippon Station

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Commuter Rail Stop: Range of Development

- Commuter Rail Stop Jenks Street: Stop w/access in Jenks St area
- Commuter Rail Stop Clay Street: Stop w/access from Clay St. /historic station area
- Commuter Rail Stop and Station Development: Stop w/access from Clay St. /historic station area, reuse of station, garage, retail

HAAS Halman Hargens Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Capital Costs: Commuter Rail Stop

| | Jenks St | Clay St |
|--|----------|---------|
| Platforms | \$2.0m | \$3.2m |
| Platform Access (3 Locations) | \$2.8 | \$2.8 |
| Bridge Modifications and Retaining Walls | \$5.8 | \$9.7 |
| Railroad Modifications | \$3.0 | \$3.7 |
| Other | \$2.3 | \$2.3 |
| SUB-TOTAL | \$15.9 | \$21.7 |
| Concept Contingencies and Add-Ons | \$8.0 | \$10.9 |
| TOTAL | \$23.9m | \$32.6m |

HAAS Halman Hargens Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Concept Design – Station Development



HAAS Halman Hargens Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Capital Costs: Station Development

| | |
|-----------------------------------|---------|
| Commuter Rail Stop | \$21.4m |
| Renovate Building | \$6.8 |
| Parking Garage | \$17.0 |
| Other | \$1.3 |
| SUB-TOTAL | \$46.5 |
| Concept Contingencies and Add-Ons | \$23.2 |
| TOTAL | \$69.7m |

HAAS Halman Hargens Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Operating Costs and Revenues

| | Commuter Rail Stop | W/Station Development |
|-------------------------------------|--------------------|-----------------------|
| Platform Maintenance | \$0.04m | \$0.04m |
| Facilities Operations & Maintenance | \$0.003 | \$0.496 |
| Parking O&M | \$0.04 | \$0.95 |
| TOTAL | \$0.083 | \$1.491 million |
| Parking Revenues | \$0.06 | \$0.57 |
| Lease Revenues | \$0.00 | \$0.53 |
| TOTAL | 0.06 | \$1.10 |
| NET | (\$0.023m) | (\$0.387) million |

HAAS Halman Hargens Associates, Inc.

PAWTUCKET/CENTRAL FALLS Commuter Rail Facility

Capital Funding Strategies

| | Jenks St | Clay St | W/Station Development |
|--|---------------|---------------|-----------------------|
| Federal Sources (New Starts) | \$19.1m (80%) | \$26.1m (80%) | \$27.9m (40%) |
| State Sources (General Obligation Bonds) | \$4.8 (20%) | \$6.5 (20%) | \$41.8 (60%) |
| Finance Charges/Bond Interest | \$3.4 | \$4.7 | \$30.1 |
| TOTAL | \$27.3m | \$37.3m | \$99.8m |

HAAS Halman Hargens Associates, Inc.

Summary of Project Findings

- **Phase I** – 23 out of 30 MBTA trains that pass through Pawtucket/Central Falls today could stop at a new commuter rail facility
- **Phase II** – The historic depot location is the preferred site for a new commuter rail facility
- **Phase III** – A commuter rail stop can be built to serve Pawtucket/Central Falls for approximately \$25 to \$30 million

Summary of Project Findings

- A phased implementation plan can help support economic development
- Traffic and parking issues can be addressed
- A \$25 million capital project is doable

Planning for Implementation

- Final report by June 30th
- State led discussions with railroad stakeholders
- Environmental Review (NEPA Process)
- Design of commuter rail stop
- Construction



Pawtucket/Central Falls Commuter Rail Facility – Public Meeting #4

June 7, 2007



Meeting Notes

Attendees: See Attached Sign-In Sheet

Date/Time: May 10, 2007; 6:00 PM

Project No.: 09736.00

Place: Central Falls YWCA
43 Hawes Street
Central Falls, RI 02863

Re: Pawtucket/Central Falls Commuter Rail
Facility Feasibility Study and Site Analysis
TOD Charrette #1

Notes taken by: Nelson/Nygaard

The purpose of the first TOD charrette was to inform the community of the project status, present a broad overview of transit oriented development, and to give the community an opportunity to speak about neighborhood issues and concerns and visions regarding the station site area. The charrette consisted of a project update, a presentation on TOD, and two community break-out sessions - one for current neighborhood issues and concerns followed by a second session regarding the future of the neighborhood.

Project Update

Mike Cassidy, Director of Planning and Redevelopment for the City of Pawtucket, gave a brief presentation concerning project status, including an update on the status of the proposed CVS/pharmacy store.

TOD Overview

Jason Schreiber, Nelson Nygaard Associates, presented an overview of transit oriented development. The presentation included some basic TOD definitions as well as examples both of good and bad TOD initiatives.

Break-Out Session #1

The purpose of the first break-out session was to elicit community concerns about the existing area around the station. Small groups gathered around an aerial photo of the study area and wrote their ideas on the map. After about 20 minutes, the large group reconvened and a representative from each small group reported on that group's discussions.

The community identified the following likes and dislikes during the first break-out session:

| Likes | |
|--|---|
| Transportation & Access <ul style="list-style-type: none"> • Feel safe walking • Central location • On bus line | Neighborhood Resources <ul style="list-style-type: none"> • Drugstore on corner/local services • Mom and pop stores • Barton Street improved with new housing • Neighborhood crime watch • Cleanups/block parties • Rents are affordable? • PCDC--\$14 million into the community (earth day, block party, got rid of prostitutes) • Homey environment |
| Dislikes | |
| Transportation <ul style="list-style-type: none"> • Traffic after work • On-street parking for tenants • High-speed traffic is dangerous • Snow?? • Too much traffic between 2 and 6 p.m. on Broad and Dexter, also at Barton • Unsafe streets for kids to walk unsupervised and elderly to walk too • Congestion—station is in the heart of the neighborhood • Traffic congestion will increase • Pedestrian safety from cars | Safety <ul style="list-style-type: none"> • Montgomery Street feels unsafe • Dark empty around depot • People who hang around Walgreens • Getting honked at • Prostitutes/johns • Violence • 204 Broad Street—fence it in? • Prostitutes want train riders for higher clientele • Poor lighting everywhere—on Broad St. & around the station |
| Economic Development <ul style="list-style-type: none"> • Not enough jobs today or from station • Station isn't economically feasible • Fear of landlords buying up properties and gentrifying the area • Fear of taxes going up • PCDC efforts will be for nothing if train ruins all their progress • Gentrification will push low-income and elderly residents out of their homes | Public Process <ul style="list-style-type: none"> • So much \$\$ already gone into station, why not put it into community improvements that you are saying will happen as result of station? • Want to see a medical facility—where are city priorities? • Don't want outsiders, who don't live there but scream "Save the building!" Why should they have a say in what happens in our neighborhood? • Process hasn't had residents' interest at heart, they are an afterthought • Schools need \$\$, why not invest in them? • Priority for Boston commuters, not us |
| Environment <ul style="list-style-type: none"> • Noise from traffic and train • Fear of losing neighborhood feel • Fear of losing the unity of community to outsiders | |

Break-Out Session #2

The purpose of the second break-out session was to determine community vision for the neighborhood around the station area. Small groups again gathered around an aerial photo of the study area and wrote their ideas on the map. After about 20 minutes, the large group reconvened and a representative from each small group reported on that group's discussions.

The community envisioned the following as desirable for the future:

| | |
|--|---|
| Housing Affordability <ul style="list-style-type: none"> • Affordable housing • A rent control-type program • Different tax rates for multiple-property owners vs. single-property owners • Tax stabilization • Homestead protection • Concern about gentrification | Proposed Train Station Site <ul style="list-style-type: none"> • Tear down the train station • Preserve the train station building • Use the proposed site as a train station • Use Cumberland/Smithfield Ave. locations • University Campus • Education programs • Arts programs • Johnson and Wales program • Medical facility • Community center • Do something with the vacant building at the proposed site • Find creative solutions to fix it |
| Economic Development <ul style="list-style-type: none"> • More retail (small businesses) • New jobs • Protect existing small businesses • No empty storefronts – retail mall • Use the revenue from the TOD to fund community improvements | Other <ul style="list-style-type: none"> • Scholarship money for kids who take the train to URI • Fast development schedule • Don't attract outsiders • No more crime • More undercover cops • Want private security • Create a feeling of safety • Get rid of prostitution in the area • Keep the character of the neighborhood the same • Preserve the residents' existing way of life • Concern for fellow neighbors • People come first • Recognize that there are two issues: the historic train station building and the platform below • Use City money to benefit residents, not commuters |
| Driving Environment <ul style="list-style-type: none"> • Potholes fixed • Better design of traffic patterns • No parking at train station (so it won't create new traffic) • Prevent overflow commuters from South Attleboro park-and-ride | |
| Pedestrian Environment <ul style="list-style-type: none"> • Lighting • Clear signage • Regular street cleaning • Better sidewalks to avoid tripping | |
| Community Amenities <ul style="list-style-type: none"> • Parks and other types of green space • Public pool, playground • Benches • Place for teens to hang out, such a recreation center • Make the area livelier, with tourist attractions about the history of Pawtucket (jewelry, etc.) • Community programs for kids | |

Attachments:

- Sign-In Sheet

NN/md

xc: Attendees, File

City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis

Meeting Attendance Sheet – TOD Charette #1

| Date: May 10, 2007 | | Time: 6:30 PM – 8:30 PM | | Location: YWCA, 43 Hawes Street, Central Falls | |
|--------------------|------------------------|-------------------------------------|-----------------------|--|--|
| Name | Representing | Address | Phone | E-mail | |
| JANICE WILK | | 175 Broad St Apt 24 | 7244181 | | |
| DIANE FAGAN | KIPPALYM | 175 Broad St Apt 24 | CEL Phone 228 5074 | | |
| MICHAEL CARLONE | STORE 24 | 130 Broad St. | 4753941 | | |
| NANCY WHITE | DCDC | 210 West Ave. | 726-1173, Ext 114 | nancywhite@pawtucket.com | |
| DON JEFFERSON | Pawtucket City Council | 101 Vine Street (Pawtucket, RI) | 726-0559 | DERESIONE@verizon.com | |
| NANCY HOWARD | RTSC | 229 Wethermen St. Providence, RI | 331-0131 | nhoward@lisc.org | |

City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis

Meeting Attendance Sheet – TOD Charette #1

| Date: May 10, 2007 | | Time: 6:30 PM – 8:30 PM | | Location: YWCA, 43 Hawes Street, Central Falls | |
|----------------------------|---------------------------|-----------------------------------|------------------|--|--|
| Name | Representing | Address | Phone | E-mail | |
| LUARDO BOSTRINO | CITY COUNCIL WARD 3 CF | 7 TOWERING ST CENTRAL FALLS RI | 401-725-1502 | CONDELLMAN@PAW.RI.GOV A VERIZON.NET | |
| Ed Tetym | MAYOR DOYLE | 137 ROOSEVELT HWY. | 728-0500 8358 | | |
| ROD LAFAMME | | 159 MONTGOMERY ST | 663-5175 | | |
| RICH DAVIS | Pawtucket Foundation | | 725-4400 | | |
| Colleen Doyle Ndoye | PCDC | 210 WEST AVE | 726-1173 | | |
| Fred Ordonez | Progreso Latino | 626 Broad St | 728-5920 | wordonez@ progreso1940.org | |
| Fernando Sonja Arboleda | | 170 Barton St. | 723-5292 | — | |

City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis

Meeting Attendance Sheet - TOD Charette #1

| Date: May 10, 2007 | | Time: 6:30 PM - 8:30 PM | | Location: YWCA, 43 Hawes Street, Central Falls | |
|--------------------|--------------|--|-------|--|--|
| Name | Representing | Address | Phone | E-mail | |
| NEL VENT | DTK | 155 MASSACHUSETTS AVE, BOSTON 02115 | | | |
| James Mander | | 16 hant st C Falls | | | |
| Kevin Ufford | RENEW/PO | 210 West Ave. | | LiviaDalyado@Pawtucketre.com | |
| Steve Peadar | | 107 Sacred Heart Ave. Apt 1-722-4721 | | | |
| Sean Seelbinder | SMPO | 5858 Ridgeway Court Apt 204 Memphis TN 38120 901 327 7676 | | | |
| | | | | | |
| | | | | | |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

Meeting Attendance Sheet – TOD Charette #1

[illegible]



Vanasse Hangen Brustlin, Inc.

99 High Street, 10th Floor
Boston, Massachusetts 02110
617 728-7777
FAX 617 728-7782

Meeting Notes

Attendees: See Attached Sign-In Sheet

Date/Time: May 24, 2007; 6:00 PM

Project No.: 09736.00

Place: Central Falls YWCA
43 Hawes Street
Central Falls, RI 02863

Re: Pawtucket/Central Falls Commuter Rail
Facility Feasibility Study and Site Analysis
TOD Charrette #2

Notes taken by: Nelson/Nygaard

The purpose of the second TOD charrette was to give the public an opportunity to expand on their concerns and obtain answers to questions in five areas related to the Pawtucket/Central Falls Commuter Rail Stop development: traffic and parking, economic development (jobs and housing), commuter rail stop, neighborhood update, and safety. The charrette format was an informal two-hour open house, during which the public could drop in at any time.

Ranking of Concerns

Upon entering, people were given dot stickers to place on a list of concerns identified in the first TOD charrette to rank the most pressing issues. Figure 1 shows how the community ranked concerns in terms of total number of dots; Figure 2 shows the priority rankings by percentage.

Figure 1

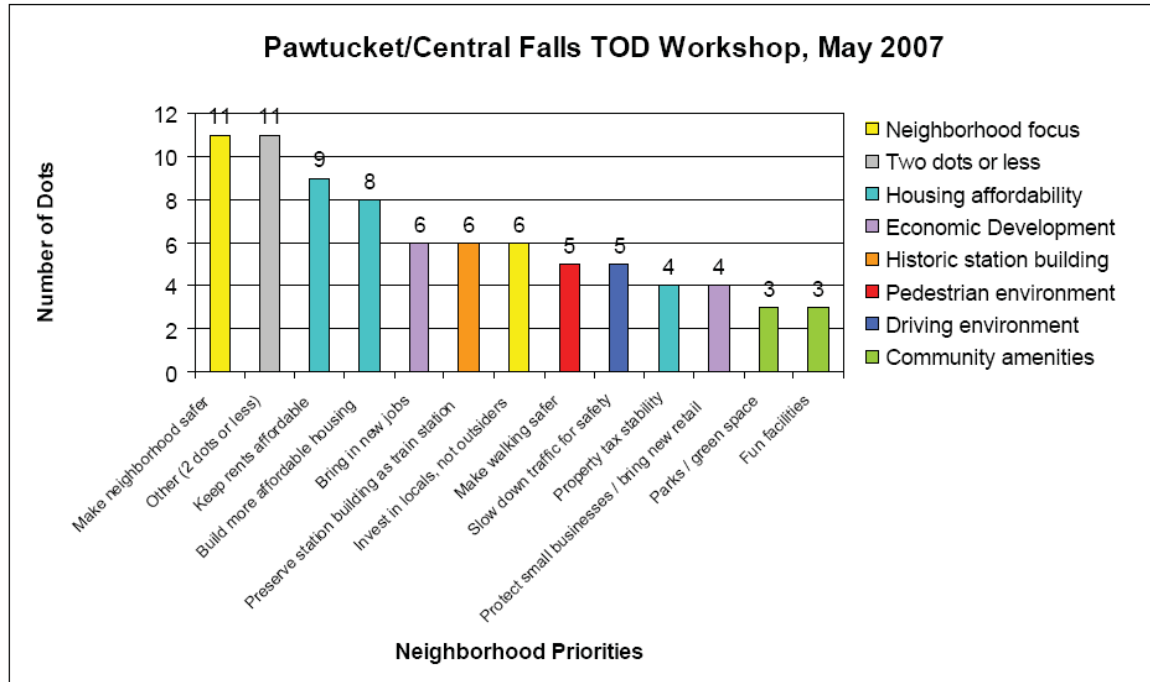
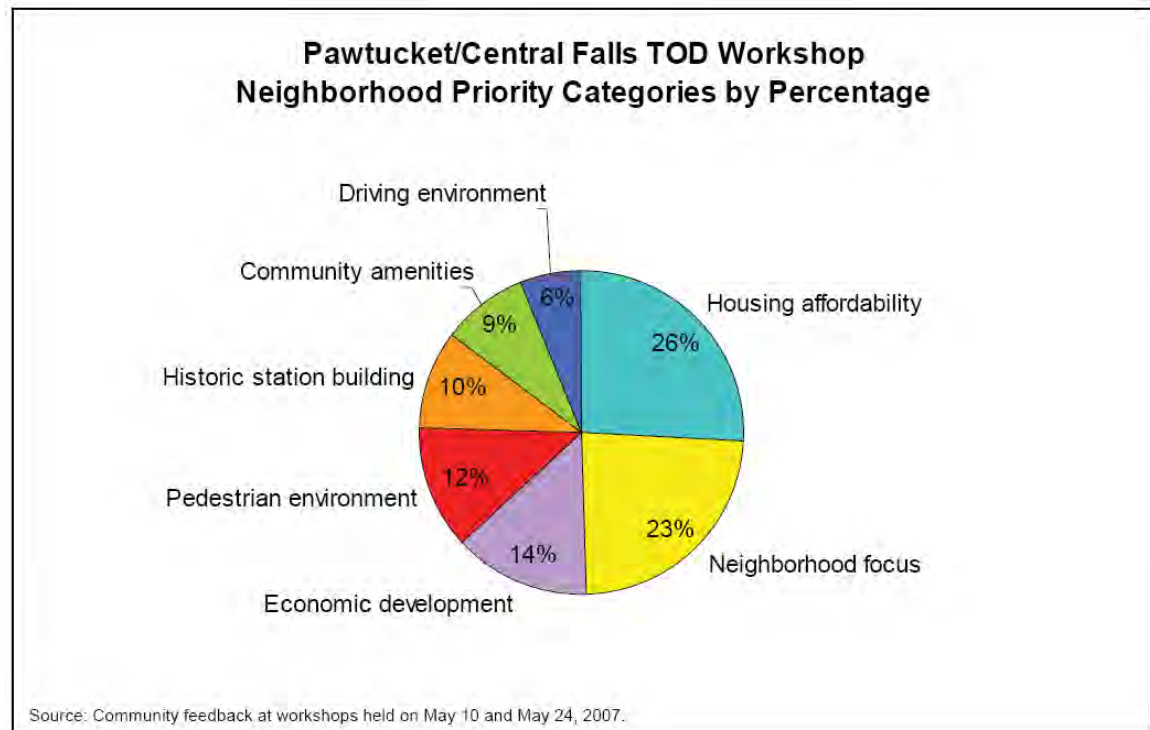


Figure 2



Traffic and Parking

The public was also invited to circulate through five informational stations. Nelson/Nygaard led the traffic and parking station, where people talked about their concerns related to traffic congestion, driving speed, and on-street parking availability. The community learned that traffic at TODs could be avoided by the following actions:

- Minimize station parking
- Improve pedestrian and bicycle access
- De-emphasize automobile access
- Accommodate bus access
- Provide a mix of uses nearby
- Increase density

The community placed dots on a map of the study area to show the locations where they encounter the worst traffic congestion and parking problems, as well as where they would consider commuter parking to be feasible, if the lots were publicly available. Figures 3, 4, and 5 list the identified traffic congestion areas, parking problems, and potential parking areas.

Figure 3 Traffic Congestion Locations



Figure 4 Parking Problem Locations

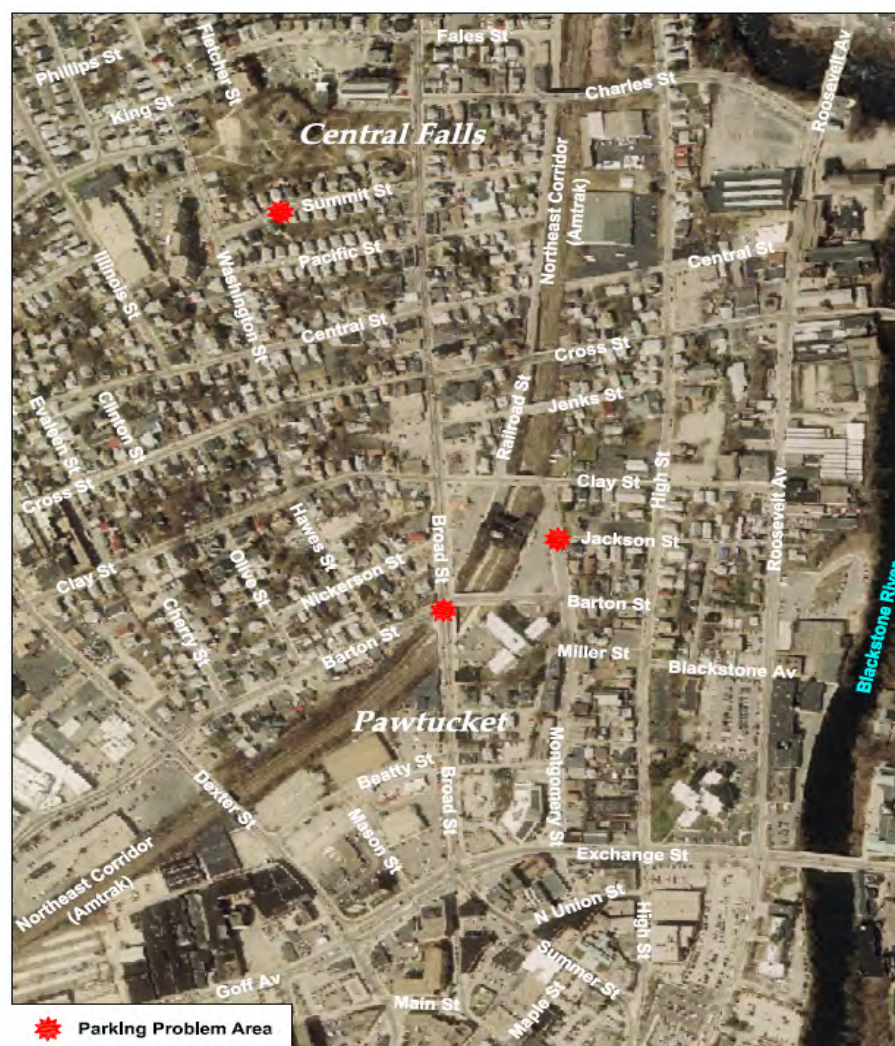


Figure 5 Potential Parking Areas



Economic Development

At the economic development station, neighbors expressed concerns over needing more job opportunities and preventing gentrification that might accompany a new commuter rail stop. They learned about economic development tools such as zoning, special districts, financing, capital expenditures, and marketing.

Commuter Rail Stop

The commuter rail stop informational station, run by VHB, contained drawings of the proposed station site plan. The intent of these renderings was to demonstrate that the historic station site could be redeveloped independent of the construction of a commuter rail stop, and that a stop would not require a large area.

Neighborhood Update

The neighborhood update station, run by Nancy Whit of PCDC, provided an overview of recent development activity in the neighborhood, including the El Salvador Restaurant, Callaghan Gardens, 141 Montgomery Street, Phil's Catering, and the Barton Street Playground.

Safety

The safety station was staffed by two Pawtucket police officers, and addressed concerns such as unsafe pedestrian environments and unsafe individuals. Residents learned some ways to improve safety near TODs, including residents and businesses having their eyes on the street, a mix of uses generating 24-hour activity, pedestrian improvements eliminating dark or remote areas, and walking police patrols.

Attachments:

- Sign-In Sheet

NN/md

xc: Attendees, File

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

Meeting Attendance Sheet – TOD Charette #2

| Date: May 24, 2007 | | Time: 6:00 PM – 8:00 PM | | Location: YWCA, 43 Hawes Street, Central Falls | |
|--------------------|-----------------------|---------------------------------------|----------------|--|--|
| Name | Representing | Address | Phone | E-mail | |
| HARVEY GOULET | CITY OF PAWT | 190 RANFALL ST | 723-4515 | | |
| Deana Gill | City of Central Falls | 15 Summit St | | | |
| Stephen C. Berry | Central Falls | 15 Summit | | | |
| ELHADJ NIAZ | CITY PAWT | 11 NICKERSON ST | (201) 688 5305 | | |
| GEORGE JOHNSON | RI STATEWIDE PLANNING | ONE CHATTAHOOCHEE RD PROVIDENCE RI | 401-222-6490 | gjohnson@planning.state.ri.us | |
| Joy Potraca | CF PAW | 200 Washington | 401-922-6262 | | |
| | | | | | |

**City of Pawtucket, Department of Planning and Redevelopment
The Pawtucket/Central Falls Commuter Rail Facility Feasibility Study and Site Analysis**

Meeting Attendance Sheet – TOD Charette #2

| | | | | | |
|---------------------------|---------------------|--------------------------------|--------------|---|--|
| Date: May 24, 2007 | | Time: 6:00 PM – 8:00 PM | | Location: YWCA, 43 Hawes Street, Central Falls | |
| Name | Representing | Address | Phone | E-mail | |
| Chris Marcans | CF PCW | 227 Zone St | 305-5366 | | |
| | | | | | |
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Appendix B: Phase I Environmental Assessments

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Historic Station/Pawtucket Commuter Rail Facility Feasibility Study

Central Falls and Pawtucket,
Rhode Island

Prepared for: City of Pawtucket, Rhode Island
Department of Planning and Redevelopment

Prepared by: **VHB**/Vanasse Hangen Brustlin, Inc.
Providence, Rhode Island

October 2006

Historic Station

Central Falls and Pawtucket, Rhode Island

Prepared for: **City of Pawtucket, Rhode Island**
Department of Planning and Redevelopment

Prepared by: ***VHB*/Vanasse Hangen Brustlin, Inc.**
Providence, Rhode Island

Project Scientist:

Emily C. Scurso

Environmental Professional:

Michele S.W. Paul, LSP

October 2006

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Executive Summary

At the request of The City of Pawtucket (the Client), Vanasse Hangen Brustlin, Inc. (VHB) conducted a Phase I Environmental Site Assessment (PESA) for property located at the intersection of Broad Street and Clay Street in Pawtucket, Rhode Island (referred to herein as the Site). The Site is further defined by the City of Central Falls Tax Assessor's Office as Assessor's Plat (A.P.) 1, Lot 309 and by the City of Pawtucket as A.P. 43B, Lots 602, 603, and 604.

The Client is a prospective purchaser of the Site and this PESA was conducted to identify the potential for Recognized Environmental Conditions (RECs) based on review of available environmental information and observations of overt evidence of a release or threat of a release of oil or hazardous materials (OHM) at and in the vicinity of the Site. The PESA was completed utilizing ASTM E 1527-05 "Standard Practice for Environmental Site Assessments for Commercial Real Estate" as guidance.

The entire Site was surrounded by a chain link fence and the site reconnaissance was performed by walking along the perimeter of the fence on public side walks, since Site access was not granted by the owner. Other than the above assumption and those limitations expressly provided in Appendix A, completion of this PESA was not subject to significant assumptions, limitations, or exceptions to the ASTM E 1527-05 standard.

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527 of Central Falls Plat 1, Lot 309 and Pawtucket 43B, Lots 602, 603, and 604, the property. Any exceptions to, or deletions from, this practice are described above. This assessment revealed evidence of recognized environmental conditions in connection with the property.

Site Location and Vicinity Description

The Site was an approximately 3.52-acre parcel located on the northeast side of the intersection of Broad Street and Barton Street in Pawtucket, Rhode Island. The southern portion of the Site was further identified on the City of Pawtucket Tax Assessor's Plat (A.P.) 43B, Lots 602, 603, and 604 and the northern portion of the Site was identified on the City of Central Falls Tax Assessor's A.P. 1, Lot 309. The Site is



bounded on the south by Barton Street, on the east by Montgomery Street, on the north by Clay Street, and on the west by Broad Street. An Amtrak railroad track bisected the Site in a northeast-southwest direction.

Site History Overview

Based on Sanborn Fire Insurance mapping of the Site, in the late 1800s numerous buildings were located at the Site and the railroad tracks that currently bisect the Site were located to the east of the Site. Based on Sanborn Fire Insurance mapping, in the early 1900s the Site was used as a train station and the railroad tracks were relocated to their present location. Based on aerial photographs and Sanborn Fire Insurance mapping, the railroad station building located at the Site was used as a station from the early 1900s until the 1970s. Presently, it appears that the train station building located at the Site is vacant. During VHB's site reconnaissance, the building was located in the central portion of the Site, spanning Amtrak railroad tracks.

Based on the 1949 Sanborn Fire Insurance Map, a "filling station" was located in the northwest portion of the Site. The "filling station" was depicted as a building and four apparent USTs in the 1949 Sanborn Map. However, in the next chronologically available Sanborn Map dated 1984, the "filling station" was located in the northwest portion of the Site, but the four apparent USTs were no longer depicted. No documentation such as UST registrations or closure certificates was available at RIDEM on June 6, 2006. A building was located in the same vicinity as the "filling station" depicted in the historical Sanborn Maps at the time of the site reconnaissance.

According to a 1995 Limited Subsurface Investigation Report prepared by Environmental Science Services on Costa's Service Center located at 355 Broad Street, "an apparently inactive Gulf service station" was located at the subject Site. At the June 6, 2006 RIDEM file review, VHB observed one item in the Gulf Station file. The Gulf Station was listed as being located at 309 Broad Street and the 1989 correspondence indicated that the Gulf Station no longer needed its United States Environmental Protection Agency (USEPA) identification number since the Gulf Station no longer generated waste. No additional files were available for the Gulf Station.

Site Reconnaissance Observations

A site reconnaissance was conducted by VHB on the above-referenced property (the Site) on May 5, 2006 for any indications of RECs. The reconnaissance was conducted by walking the perimeter of the Site on public sidewalks. VHB was not granted access onto the Site and a Site contact was not interviewed as part of this PESA.



Two buildings were observed at the Site at the time of the site visit. One building was located in the central portion of the Site and appeared to be a former railroad station/depot that was vacant. The second building was smaller and was located in the northwest portion of the Site. This building had the appearance of a former gasoline filling station and had no signs or other markings. At the time of the site reconnaissance, VHB observed that there was no pavement or asphalt surface located adjacent to the apparent filling station building to the south. The area to the south of the apparent filling station was observed to be a gravel surface.

VHB observed a loading dock located in the northeast portion of the former passenger station building. Since the Site reconnaissance was conducted from off-Site, VHB could not determine whether or not any staining was located in the vicinity of the loading dock.

Solid waste including food wrappers, cans and bottles, tires, plastic bags, and miscellaneous debris was observed throughout the Site. The solid waste appeared limited in nature and no staining or stressed vegetation was observed in the vicinity of the solid waste.

Findings

VHB has completed a PESA with consideration to the scope and limitations of ASTM E 1527-05 and our proposal dated December 20, 2005, at the Site located on northeast side of the intersection of Broad Street and Barton Street in Pawtucket, Rhode Island.

The following RECs were identified at the subject Site:

- **Former Filling Station** – A “filling station” building and four apparent USTs were depicted in historical Sanborn Fire Insurance mapping at the Site. No documentation such as UST registrations or closure certificates was available at RIDEM on June 6, 2006.
- **Historical Use as a Train Station** – Based on aerial photographs and Sanborn Fire Insurance mapping, the Site was used as a train station from the early 1900s to the 1970s.

Though not considered a REC in accordance with ASTM 1527-05 due to its limited nature, several areas of soil waste were observed through out the Site including food wrappers, cans and bottles, tires, plastic bags, and miscellaneous debris.

1

Introduction

Purpose and Scope of Work

At the request of the City of Pawtucket (the Client), Vanasse Hangen Brustlin, Inc. (VHB) conducted an ASTM Phase I Environmental Site Assessment (PESA) for the property located at the northeast intersection of Broad Street and Barton Street in Pawtucket and Central Falls, Rhode Island (referred to herein as “the Site”). The southern portion of the Site is further defined by as the Pawtucket Tax Assessor Plat (A.P.) 43B, Lots 602, 603, and 604 and the northern portion of the Site is defined as the Central Falls Tax Assessor A.P. 1, Lot 309.

The PESA was conducted to identify Recognized Environmental Conditions (RECs) based on review of available environmental information and observations to identify the potential for overt evidence of a release or threat of a release of oil or hazardous materials (OHM) at and in the vicinity of the Site.

The scope of services (December 20, 2005) for this PESA included: a historical review; a federal and state environmental database search; state and municipal file review; a Site reconnaissance; and interviews with people knowledgeable about the Site. The PESA was completed utilizing ASTM E 1527-05 “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process” as guidance.

Assumptions, Limitations, and Exceptions

This PESA is subject to the terms of the agreement between VHB and the Client, and the Limitations included in **Appendix A**. The approximately 3.52-acre Site was vacant and the Site owner did not allow VHB access to the Site. The site reconnaissance was performed by walking the perimeter of the Site on public sidewalks. A Site contact was not available for interview.

2

Site Description

Site Location and Description

The Site is an approximately 3.52-acre parcel located at the intersection of Broad Street and Barton Street in Pawtucket and Central Falls, Rhode Island. The southern portion of the Site is located in Pawtucket and the northern portion of the Site was located in Central Falls. A Site Location Map is included as **Figure 1**.

The southern portion of the Site is identified by the Pawtucket Tax Assessor's Office as Assessor's Plat (A.P.) 43B, Lots 602, 603, and 604. According to the City of Pawtucket Tax Assessor's property description card, A.P. 43B, Lots 602 and 604 are owned by Warwick Rics, LLC and A.P. 43B, Lot 603 is owned by Amtrak. Refer to **Figure 2** for a copy of the Pawtucket Tax Assessor's Map.

The northern portion of the Site is identified by the Central Falls Tax Assessor's Office as A.P. 1, Lot 309. According to the City of Central Falls Tax Assessor's property description card, A.P. 1, Lot 309 is owned by Warwick Rics, LLC and is approximately 1.49-acres. Refer to **Figure 3** for a copy of the Central Falls Tax Assessor's Map.

According to the City of Pawtucket Tax Assessor's property description card for A.P. 43B, Lot 602, a 30,168-square foot former railroad depot building, which was constructed in 1900, was located at the Site. The City of Pawtucket A.P. 43B, Lots 603 and 604 are both vacant land, according to the property description cards. Additionally, the City of Central Falls A.P. 1, Lot 309 is vacant land, according to the property description card.

The Site is bounded on the north by Barton Street to the south, Montgomery Street to the east, Clay Street to the north, and Broad Street to the west. An Amtrak railroad track, which trends in a northeast-southwest direction, bisects the Site and is located on the City of Pawtucket A.P. 43B, Lot 603 and the City of Central Falls A.P. 1, Lot 309.



Topography

The mean surface elevation of the Site is approximately 100 feet above the National Geodetic Vertical Datum of 1929 (USGS 7.5 minute series, Pawtucket, Rhode Island, Quadrangle).

During the site reconnaissance conducted by VHB in May 2006, it was observed that the western and eastern portions of the Site were generally flat. However, the central portion of the Site identified as Pawtucket A.P. 43B, Lot 603, which was occupied the Amtrak railroad track, was constructed approximately 30 feet lower than the western and eastern portions of the Site.



Soils/Surficial Geology

According to the Soil Survey of Rhode Island (Rector 1981), soil at the Site is mapped as Urban Land (Ur), which consists mostly of sites for buildings, paved roads, and parking lots.



Bedrock Geology

According to the Bedrock Geology Map of Rhode Island (Hermes et al., 1994), the underlying bedrock is characterized as the Rhode Island Formation (Pnbr), which consists of gray to black, fine- to coarse-grained quartz arenite, litharanite, shale, and conglomerate, with minor beds of anthracite and meta-anthracite.



Groundwater

Groundwater in the vicinity of the Site was classified by the Rhode Island Department of Environmental Management (RIDEM) as GB. GB groundwater classification applies to groundwater resources that are known or presumed to be degraded. As such, GB groundwater is not suitable for public or private drinking water use. The closest GA classification area is located greater than ½ mile northwest of the Site.

According to the RIDEM Wellhead Protection Map for the Pawtucket Quadrangle (dated 2005), the Site is not located within wellhead protection area. The Site and surrounding area are connected to both municipal water and sewer.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology and characteristics of the soil. Based on topography, hydrology and

previous environmental reports in the general vicinity of the Site, the inferred groundwater flow direction is to the east, towards the Blackstone River.



Wetlands

According to the RIDEM Geographic Information System Environmental Resource Map available online, no wetlands are located at the Site.



Surface Water

The Blackstone River is located approximately 2,000 feet east of the Site. According to the RIDEM Water Quality Regulations, the Blackstone River is classified as B1 {a}. Class B1 {a} surface water applies to waters designated for primary and secondary contact recreational activities and fish and wildlife habitat. Class B1 {a} waters should be suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation, and other agricultural uses. Primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges. A partial use designation applies to this waterway based on impacts from combined sewer overflow into the waterway.



Flood Plains

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map for the City of Pawtucket, Rhode Island (Community Panel No. 440022 0002 D, Panel 2 of 3, January 3, 1986), the southern portion of the Site is located within a Zone C. Zone C areas are defined as areas of minimal flooding.

According to the Federal Emergency Management Agency Flood Insurance Rate Map for the City of Central Falls, Rhode Island (Community Panel No. 445394 0001 B, only Panel printed, January 6, 1982), the northern portion of the Site is located within a Zone C.

Description of Structures

According to the City of Pawtucket Tax Assessor's property description card, a 30,168-square foot former railroad depot building, which was constructed in 1900, was located on the City of Pawtucket A.P. 43B, Lot 602. Likewise, according to the property description card, the former railroad depot building was constructed in 1900.



A the time of the site reconnaissance, a small building that resembled a gasoline filling station was observed in the northwest portion of the Site, located on the Central Falls portion of the Site.

3

Records Review

For historical information, VHB visited the Pawtucket and Central Falls City Halls, reviewed historical aerial photographs, and interviewed people knowledgeable of the Site. Information obtained is summarized below.

Chain of Title

A limited chain of title was on file at the Pawtucket City Hall for the Site. The Site was part of A.P. 43B, Lot 435 before being dropped into A.P. 43B, Lots 602, 603, and 604. Previous property owners and their duration of ownership are summarized below.

Table 1 – Chain of Title, Block 43B, Lot 435, Pawtucket, Rhode Island

| Owner (Block 43B, Lot 435) | Date |
|--|------|
| Providence and Worcester Railroad ½ and Boston and Providence Railroad ½ | 1922 |
| A.B. Corporation | 1972 |
| A+B Partnership | 1977 |

Table 2 – Chain of Title, Block 43B, Lot 602, Pawtucket, Rhode Island

| Owner (Block 43B, Lot 602) | Date |
|----------------------------|------|
| A+B Partnership | 1978 |

Table 3 – Chain of Title, Block 43B, Lot 603, Pawtucket, Rhode Island

| Owner (Block 43B, Lot 603) | Date |
|----------------------------|------|
| Amtrak | 1978 |



Table 4 – Chain of Title, Block 43B, Lot 604, Pawtucket, Rhode Island

| Owner (Block 43B, Lot 604) | Date |
|----------------------------|------|
| A+B Partnership | 1978 |

Table 5 – Chain of Title, Block 1, Lot 309, Central Falls, Rhode Island

| Owner (Block 43B, Lot 604) | Date |
|----------------------------|------|
| A&B Partnership | 1977 |
| SMPO Properties, Inc. | 2005 |
| Warwick Rics, LLC | 2005 |

According to book 210 page 163 of the City of Central Falls Deed dated December 30, 1977, there was a prior lease to Gulf Oil Corporation for A.P. 1, Lot 309.

Environmental Liens

Records reviewed at the Pawtucket City Hall revealed no environmental liens or past environmental violations for the Site. A certified title search where environmental liens would be identified is not within the scope of services for this project. A title company can complete a full title and environmental lien search.

Local Government Agency Record Review

The Pawtucket municipal offices were visited on May 5, 2006 and the Central Falls municipal offices were visited on August 25, 2006 to obtain information regarding Site history and use, zoning, and OHM use, storage, release, and/or disposal practices that may have occurred at the Site. Information obtained during the review is summarized below.

Assessor's Office

The Site was identified by the Pawtucket Tax Assessor's Office as a 3.52-acres located at A.P. 43B, Lots 602 and 603. The current property owner listed for Pawtucket A.P. 43B, Lots 602 and 604 was Warwick Rics, LLC. The current property owner listed for Pawtucket A.P. 603 was Amtrak. The property field cards are attached in **Appendix B**.

Fire Prevention Bureau

VHB visited the Pawtucket Fire Department regarding underground storage tanks (USTs) and hazardous material storage at the Site. No information regarding OHM or USTs was on file for the subject Site.

VHB contacted Chief Rene Coutu of the Central Falls Fire Department regarding underground storage tanks (USTs) and hazardous material storage at the Site. According to Chief Coutu, three 10,000-gallon gasoline USTs were removed from the site on May 4, 1999. The USTs were installed in 1975 and were fiberglass.

Building/Zoning Department

According to the information obtained at the Pawtucket Zoning Department, the southern Site parcels identified as Pawtucket Tax Assessor A.P. 43B, Lots 602, 603, and 604 were zoned Commercial General (CG) District and Residential Multifamily (RM) District. In April 1986, the City of Pawtucket issued the Site a mechanical permit.

According to the information obtained at the Central Falls Zoning Department, the northern Site parcel identified as Central Falls Tax Assessor A.P. 1, Lot 309 was zoned General Commercial District (C-2).

Pawtucket Public Library

The *Atlas of Pawtucket*, which was part of the Pawtucket Public Library collection, was published in 1880 and was authored by Hopkins. A building was depicted as being located at the Site. The building was brick and was labeled as a “passenger depot”, which was connected to a frame platform. The building was located on the eastern side of Broad Street. Adjacent to the brick “passenger depot” to the east were railroad tracks and a frame freight house. A lumber yard was located on the adjacent property to the north.

Historical Maps

Sanborn Maps are periodically issued fire insurance maps dating back to the late 1800's that show the building use, USTs, ASTs, heating sources, building construction, and other useful information. According to Environmental Data Resources, Inc. (EDR), Sanborn Fire Insurance Company maps were available for the subject property for the years 1884, 1890, 1902, 1923, 1949, and 1984. Copies of the Sanborn Maps are included in **Appendix C**.



1884 Sanborn Map

Only the northeastern portion of the Site was depicted on the 1884 Sanborn Map and no buildings were located in this portion of the Site.

1890 Sanborn Map

The Site was bounded to the north by Clay Street, to the east by buildings, to the south by Barton Street, and to the west by Broad Street. A small road, labeled as “Jackson Court”, was located in the central portion of the Site trending in a north-south direction.

Numerous small buildings were depicted throughout the entire Site. Approximately 14 buildings were depicted in the northern portion of the Site, located within the Central Falls city limits. Approximately 21 buildings were depicted in the southern portion of the Site, located within the Pawtucket city limits. Of the approximately 35 buildings that were scattered throughout the Site, only two buildings located in the southeast portion of the Site were labeled as something other than a dwelling. One building was labeled “Ice Cream Factory” and the other was labeled “Hot House”.

1902 Sanborn Map

All of the buildings that were depicted in the 1890 Sanborn Map were present except for the “Ice Cream Factory” building, the “Hot House” building, and a small unlabeled building that had been located adjacent to the “Hot House” building to the south.

The street that had formerly named “Jackson Court” was now labeled as “Aldrich Court”, which trending north-south through the central portion of the Site.

The adjacent, surrounding properties were depicted with buildings.

1923 Sanborn Map

All of the buildings located that had been depicted in the 1902 Sanborn Map were no longer depicted on the Site. A large building was depicted spanning the N.Y.N.H.&H.R.R. tracks. A “park” was depicted in the southeast corner of the Site. The railroad tracks also appeared to be trending in a northeast-southwest direction, whereas in previous Sanborn Maps, the railroad tracks were depicted as trending in a north-south direction. The street, “Aldrich Court”, was no longer depicted at the Site.

No significant changes were observed for the adjacent properties.

1949 Sanborn Map

The depiction of the Site appeared similar to the 1923 Sanborn Map, however, a “filling station” was depicted in the northwestern portion of the Site, located on the Central Falls side.



The “filling station” consisted of a building that was labeled, but due to the poor quality of the Sanborn Map copy, the writing was illegible. Four apparent USTs, which were depicted as unlabeled circles, were depicted adjacent to the “filling station” building to the south.

The adjacent property to the north was labeled as a “filling station” and two apparent USTs were depicted as being located at the “filling station”.

1984 Sanborn Map

The building that spanned the N.Y.N.H.&H.R.R. tracks was labeled “VAC & OP, PAWTUCKET-CENTRAL FALLS PASSENGER STATION, NOT USED, WAITING ROOM, BUILT-1915, FIRE PROOF CONSTRUCTION”.

The “filling station” was located in the same area of the Site as had been depicted in the 1949 Sanborn Map; however, the building footprint was smaller in area and the building was depicted with a dashed line, as opposed to a solid line representation in the 1949 Sanborn Map. Likewise, the four apparent USTs were no longer depicted adjacent to the “filling station” building to the south.

The “filling station” located adjacent to the Site to the north was still present, however, the two apparent USTs were no longer depicted in the 1984 Sanborn Map.

Historical Topographic Maps

Historical topographic maps were reviewed through EDR and were available for the Site for the years 1949, 1970, 1975, and 1998. The railroad and a building located in the central portion of the Site were both depicted in the historical topographic maps. The railroad tracks were observed to trend in a northeast-southwest direction. The railroad and building depiction remained unchanged in the USGS 7.5 minute series Pawtucket, Rhode Island Quadrangle reviewed for the years 1949, 1970, 1975, and 1998. Copies of the historical topographic maps are included in **Appendix D**

Aerial Photography

VHB personnel reviewed aerial photographs dated 1939, 1951 to 1952, 1962, 1972, 1976, 1981, 1988, 1992 and 2003 for the Site and vicinity. Photograph interpretations are summarized below.

1939 Aerial Photograph

Two building were observed to be located at the Site. A smaller building was located in the northeast portion of the Site and a larger building spanning northeast-southwest trending railroad tracks were observed. The remaining portion of the Site appeared to have been paved.



The surrounding areas were densely populated with numerous buildings.

1951 to 1952 Aerial Photograph

No significant changes from the 1939 aerial photograph.

1962 Aerial Photograph

The northwest and southeast portions of the Site appeared to have been used as a parking lot, as numerous automobiles were observed in the aerial photograph.

1972 Aerial Photograph

A few less automobiles were observed, but otherwise, no additional significant changes from the 1962 aerial photograph.

1976 Aerial Photograph

No significant changes from the 1972 aerial photograph

1981 Aerial Photograph

The building located in the northwest portion of the Site was demolished and its former footprint was visible in the aerial photograph. A new building, located adjacent to the former building to the north, was located at the Site.

1988 Aerial Photograph

No significant changes from the 1981 aerial photograph.

1992 Aerial Photograph

Individual parking spaces for automobiles were observed to be painted on the paved surfaces of the Site.

Historical City Directories

City Street Directories were reviewed at the City of Pawtucket library in an effort to determine past uses of the property. Occupants listed for the Site in the historical city directories are summarized below.

1908 Pawtucket City Directory

Occupant Listed for 00 Broad Street - Pawtucket Depot

1918 Pawtucket City Directory

Occupant Listed for 00 Broad Street - New York, New Haven, and Hartford Rail Road Depot

1928 Pawtucket City Directory

Occupant Listed for 00 Broad Street - New York, New Haven, and Hartford Rail Road Depot



1938 Pawtucket City Directory

Occupant Listed for 00 Broad Street - New York, New Haven, and Hartford Rail Road Depot

1948 Pawtucket City Directory

Occupants Listed for 00 Broad Street - New York, New Haven, and Hartford Rail Road Depot, Railway Express Agency, Inc., and Yellow Cab Taxi

1958 Pawtucket City Directory

Occupants Listed for 00 Broad Street - New York, New Haven, and Hartford Rail Road Depot and Pawtucket Taxi

1968 Pawtucket City Directory

No listing for 00 Broad Street

Previous Investigations/Assessments

VHB conducted a file review at the RIDEM on June 6, 2006. Information gathered from this assessment is discussed in the Regulatory File Search Section of this report. No previous investigations or assessments of this Site were available at the time of the RIDEM file review.

4

Regulatory File Search

A review of federal and state environmental databases and state and local records was conducted to help identify properties in the vicinity of the Site that have had a release or threat of release of oil and/or hazardous materials and may impact the environmental quality of the Site. VHB reviewed the following databases at the ASTM specified radii:

- National Priorities List (NPL); 1 mile - A database operated by the USEPA as an inventory of hazardous materials disposal sites that have been reported to the Federal government and been determined to be a priority for a Federally overseen cleanup.
- Resource Conservation and Recovery Information System (RCRIS) Transportation, Storage Disposal Facility (TSD); 0.5 mile - A database operated by the USEPA as an inventory of hazardous waste treatment, storage and disposal facilities.
- RCRIS Generators (GN); 0.25 mile - A database operated by the USEPA as an inventory of hazardous waste generators who store hazardous waste on their properties for periods not to exceed 90 days.
- RCRIS Corrective Action Sites (COR); 1 mile - A database operated by the USEPA as an inventory of hazardous waste treatment, storage and disposal facilities requiring a Federal oversight.
- RCRIS No Longer Regulated (NLR); 0.25 mile - A database operated by the USEPA as an inventory of former hazardous waste generators.
- Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) Sites; 0.5 mile - A database operated by the USEPA as an inventory of potential hazardous materials sites that have been reported to the Federal government.



- Emergency Response Notification System (ERNS); 0.25 mile - A database operated by the USEPA as an inventory of hazardous materials or petroleum spills.
- Facility Index System (FINDS); 0.25 mile - A database operated by the USEPA as an inventory of environmental permitted facilities (air, water, hazardous materials).
- State Hazardous Waste Sites (SHWS); 1 mile - A database operated by the Rhode Island Department of Environmental Management of properties regulated by the Rhode Island Remediation Regulations (hazardous materials and petroleum sites).
- Underground Storage Tanks (UST); 0.25 mile - A database of underground storage tank facilities.
- Leaking Underground Storage Tanks (LUST); 0.5 mile – A database of leaking underground storage tank facilities.
- Solid Waste Landfills (SWL); 0.5 mile - A database of active and closed solid waste landfills.

A summary of the database search information and maps indicating the locations of specific properties is provided in **Appendix D**. No COR properties were listed within the specified search distance. The database search identified 31 UST facilities, 23 LUST facilities, one RCRA-LQG facility, 24 RCRA-SQG facilities, two RI INST CONTROL properties, one manufactured gas plant, 39 Rhode Island SHWS properties, and one Massachusetts SHWS property. Based on the findings of the EDR database review, VHB requested files for the following properties on June 6, 2006 from the RIDEM Office of Technical & Customer Assistance.

- **Pawtucket and Central Falls Train Station** / Broad Street – Subject Site
- **Costa's Service Center** / 355 Broad Street – UST, RCRA, and LUST facility
- **Gulf Station** / 309 Broad Street – RCRA facility
- **Pawtucket Auto Supply** / 306 Broad Street – RCRA, UST, and LUST facility
- **Empty Lot** / 286 to 288 Broad Street – UST property
- **Philip J. Lappin, MD** / 300 Broad Street – UST facility
- **D&B Auto Sales** / 88 Barton Street – RCRA facility
- **Montgomery Terrace Apartments** / 159 Montgomery Street – UST property
- **YWCA of Greater Rhode Island** / 324 Broad Street – UST facility
- **Fleet National Bank** / 375 Broad Street – UST facility

Information obtained at the time of the RIDEM file review is presented in the following section. Copies of the RIDEM files can be found in **Appendix E**. The remaining properties identified in the database search are not anticipated to present



a significant threat to the Site based on the distance from the Site, direction with respect to inferred groundwater flow direction, and/or completed remedial status.



Pawtucket and Central Falls Train Station – Subject Site Broad Street, Pawtucket and Central Falls, RI

The subject Site was not identified in any of the databases included in the EDR database search. Likewise, RIDEM did not have any files available for the subject Site on June 6, 2006.



Gulf Station 309 Broad Street, Pawtucket, RI

According to the August 1995 ESS Limited Subsurface Investigation report completed on the Costa's Service Center property, "across Clay Street from the subject property [Costa's Service Center] is an apparently inactive Gulf service station". This property was identified as a RCRA facility. The only information obtained from the RIDEM LUST file was a Closure Application for a 275-gallon UST and disposal documentation for "Oil Spill Debris". The 275-gallon UST was used to store No. 2 fuel oil. The RIDEM records indicate that this UST was removed from the property on June 23, 1992.



Costa's Service Center 355 Broad Street, Central Falls, RI

This property is located across Clay Street and was adjacent to the subject Site to the northwest. Costa's Service Center was identified as a UST, RCRA, and LUST facility in the EDR report. According to files reviewed at the time of the RIDEM file review, five USTs were removed from the facility on May 16, 1995. The property was used a former gasoline station and automobile service station. The five USTs included two 4,000-gallon gasoline USTs, two 2,000-gallon gasoline USTs, and one 1,000-gallon waste oil UST. At the time of the UST removals, an apparent release of petroleum was observed, as documented in Environmental Science Services (ESS) UST Closure Report.

ESS prepared a Limited Subsurface Investigation report in August 1995 for the facility. Three soil borings and one monitoring well were installed at the property and soil and groundwater samples were collected. Total petroleum hydrocarbons (TPH) were detected in soil at concentrations as high as 2,300 parts per million (ppm). The most heavily impacted soil was collected from a depth of 19 to 21 feet below grade. BTEX was detected in groundwater at a concentration of 0.441 ppm.

On September 20, 1995, RIDEM issued the property a No Further Action Letter.

■

Pawtucket Auto Supply
306 Broad Street, Pawtucket, RI

This property was identified in the EDR report as a RCRA, UST, and LUST facility and is located on the opposite side of Broad Street from the subject Site. A former 500-gallon (initially misidentified in several reports as 1,000-gallons) heating oil UST was located beneath the basement floor in the northeast corner of the building located at the property. According to a May 2003 Release Characterization Report prepared by Environmental Consulting Services, Inc. (ECS), seven 55-gallon drums of petroleum impacted soil was removed from the UST area at the time of closure. Two soil samples were collected from beneath the former UST and tested for TPH and the average TPH concentration was 1,879 milligrams per kilogram (mg/kg). On October 22, 2003, RIDEM issued the property a No Further Action Letter in regard to the 500-gallon UST that was closed in place.

Pawtucket Auto Supply was also listed as a small quantity RCRA generator. On July 8, 1988, RIDEM issued the property a Letter of Deficiency during an inspection for disposing of chemicals improperly. The types of hazardous waste generated at the property includes spent parts cleaning solution, sodium hydroxide, thinner, and mineral spirits.

■

Empty Lot
286 to 288 Broad Street, Pawtucket, RI

This property, which was located on the opposite side of Broad Street from the subject Site to the east, was identified as a UST facility in the EDR report. Three 1,000-gallon gasoline USTs were permanently closed at this property, according to the EDR report.

Two documents were observed in the file at the time of the RIDEM file review: Certificate of Closure for USTs dated May 21, 1987 and a Permanent Closure Application dated May 21, 1987. According to these forms, one 6,000-gallon No. 2 oil/kerosene UST, one 1,000-gallon No. 2 oil UST, and one 500-gallon waste oil UST were closed at the vacant lot owned by the Central Falls Credit Union.

■

Philip J. Lappin, M.D. Property
300 Barton Street, Pawtucket, RI

This property was a UST facility and was located on the opposite side of Broad Street from the subject Site, to the west. According to the EDR report, one 3,000-gallon No. 2 heating oil UST was permanently closed at the property. According to files



reviewed at RIDEM, the UST was removed on October 5, 1995 and no apparent release of petroleum was observed from the UST at the time of the UST closure.



D&B Auto Sales
88 Broad Street, Pawtucket, RI

This facility is a RCRA generator and is located approximately 800 feet south of the subject Site. According to files dated 1984 that were reviewed at RIDEM, D&B Auto Sales generated waste paint thinner, flammable liquid used in auto painting, and used motor oil. Letter of Deficiencies were not observed at the time of the RIDEM file review.



Montgomery Terrace Apartments
159 Montgomery Street, Pawtucket, RI

This facility is located across Montgomery Street, adjacent to the subject Site to the east. According to the EDR report, one 1000-gallon No. 2 heating oil UST, which was installed in November 1960, is in use at the property.

RIDEM UST Facility Certificate of Registration forms were observed at RIDEM for 1,000-gallon heating oil UST for 1999 to the present.



YWCA of Greater Rhode Island
324 Broad Street, Pawtucket, RI

According to the EDR report, this property, which is located on the opposite side of Broad Street from the subject Site, is a UST facility. One 3,000-gallon No. 2 heating oil UST was permanently closed at this property.

A UST Closure Certificate was observed at RIDEM dated June 16, 2004 for one 3,000-gallon No. 2 heating oil UST that was 82 years old. No documentation was observed in the RIDEM files regarding whether or not a release of petroleum was observed at the time of the UST removal.



Fleet National Bank
375 Broad Street, Pawtucket, RI

One 2,000-gallon No. 2 heating oil UST was permanently closed at this UST facility, according to the EDR report. This property is located on the opposite side of Broad Street from the subject Site.



According to a UST Closure Assessment Report, the 2,000-gallon No. 2 heating oil UST was removed on October 12, 2004 and all confirmatory soil samples collected from the tank grave did not contain concentrations of TPH that were detected above the laboratory reporting limits.

Other Sites Identified in the EDR Radius Report

The sites listed in **Table 1** are properties appearing in the database search located within the vicinity of the subject Site. Based upon a review of RIDEM records, and the distance and direction of groundwater flow from the subject Site, these properties do not appear to present a significant environmental hazard to the subject Site.

Table 5 – Nearby Listed Sites

| Property Name | Property Type | Address | Distance and Direction |
|-----------------------------------|----------------------|---------|------------------------|
| *Pole #95 | MA SHWS, MA RELEASE | --- | --- |
| * Bacon Street | MA SHWS, MA RELEASE | --- | --- |
| *Robinson Ave Substation | MA SHWS, MA RELEASE | --- | --- |
| *Off Ramp | MA SHWS, MA RELEASE | --- | --- |
| *Weigh Station South Exit 3 | MA SHWS, MA RELEASE | --- | --- |
| *RTE 95 N Bound | MA SHWS, MA RELEASE | --- | --- |
| *North On Ramp | MA SHWS, MA RELEASE | --- | --- |
| *Between Exits 2 & 3 | MA SHWS, MA RELEASE | --- | --- |
| *Near Exit 2 | MA SHWS, MA RELEASE | --- | --- |
| *No Location Aid | MA SHWS | --- | --- |
| *Forest St. Substation | MA SHWS, MA RELEASE | --- | --- |
| *Knights of Columbus | MA SHWS | --- | --- |
| *Cumberland Farm Gas Station | MA SHWS, MA RELEASE | --- | --- |
| *Tenneco Metering Station | RI SHWS | --- | --- |
| *Burnt Swamp Road Disposal | RI SHWS | --- | --- |
| *Blackstone Valley Wilderness | RI SHWS | --- | --- |
| *Peterson Puritan Superfund | RCRA, RI SHWS, FINDS | --- | --- |
| *Peterson/Puritan | RI SHWS | --- | --- |
| *Lonzo/Universal Chemical | RI SHWS | --- | --- |
| *Pacific Anchor Corp | RI SHWS | --- | --- |
| *Thompson Hill Water Storage Tank | RI SHWS | --- | --- |
| *Tennessee Gas/Pawt. Meter | RI SHWS | --- | --- |
| *Calcagni Properties | RI SHWS | --- | --- |
| *Cumberland & Monastery | RI SHWS | --- | --- |



| | | | |
|--------------------------------|--------------------------|-----|-----|
| Wa king Trail | | | |
| *Pawtucket Water Supply Board | RI SHWS | --- | --- |
| *Cumberland-Copper Mine | RI SHWS | --- | --- |
| *Blackstone River Bikeway | RI SHWS, RI INST CONTROL | --- | --- |
| *Manville Well Field | RI SHWS, CERC-NFRAP | --- | --- |
| *Centennial Towers | RI SHWS | --- | --- |
| *Schoolhouse Candy | RI SHWS | --- | --- |
| *Concord St. Developers, LLC | RI SHWS | --- | --- |
| *Washington Street | MA SHWS, MA RELEASE | --- | --- |
| *Amtrak Under Bridge | MA SHWS, MA RELEASE | --- | --- |
| *Former Gas Station | MA SHWS | --- | --- |
| *Pleasant Street Mercury Spill | CERCLIS | --- | --- |
| *Pawtucket Compost Facility | RI SWF/LF | --- | --- |
| *E-O Incorporated | RI LUST | --- | --- |
| *Paquette Properties | RI UST | --- | --- |
| *Bell Atlantic | RCRA-SQG | --- | --- |
| *Azar's Service Station | CT MANIFEST | --- | --- |
| *Cumberland & Monastery | RI SHWS | --- | --- |
| Wa king Trail | | | |
| *Pawtucket Water Supply Board | RI SHWS | --- | --- |
| *Cumberland-Copper Mine | RI SHWS | --- | --- |
| *Blackstone River Bikeway | RI SHWS, RI INST CONTROL | --- | --- |
| *Manville Well Field | RI SHWS, CERC-NFRAP | --- | --- |

* According to the EDR report, the property was not mapped due to poor or inaccurate information.

5

Site Reconnaissance

VHB conducted a Site Reconnaissance on May 5, 2006 that included observing the Site for overt evidence of oil and /and hazardous materials (OHM). Adjacent properties were also observed from exterior areas accessible to the general public. A Site Plan depicting pertinent Site features is provided as **Figure 3**. Photographs taken during the site reconnaissance are provided in **Appendix E**.

General Observations

Site reconnaissance was conducted by Ms. Emily Scurso of VHB on May 5, 2006 for any indications of RECs as defined by ASTM E 1527-05. The Site owner, Warwick Ric, LLC, did not allow access to the Site; therefore, the reconnaissance was conducted by observing the Site from exterior areas accessible to the general public.

Two buildings were observed at the Site at the time of the site visit. One building was located in the central portion of the Site and appeared to be a former railroad station/depot that was vacant. The second building was smaller and was located in the northwest portion of the Site. This building had the appearance of a former gasoline filling station.

Site Utilities

According to the Pawtucket Water Department, the Site was serviced by municipal water and sewer provided by the City of Pawtucket. Overhead electrical service was provided.

Drywells, Floor Drains and Sumps

During the site reconnaissance, VHB was not given access to the Site. As a result, VHB did not inspect the Site for any evidence of drywells, floor drains, or sumps within any of the building structures located on-Site.

VHB did not encounter any catch basins located on the property.

Hazardous Materials/Petroleum Products Storage and Handling

VHB observed a loading dock located in the northeast portion of the former passenger station building.

Polychlorinated Biphenyls

At the time of the site reconnaissance, VHB did not observe any evidence indicating the presence of polychlorinated biphenyls (PCB) at the Site.

Asbestos Containing Materials/Lead Based Paint

The 1973 National Emission Standards for Hazardous Air Pollutants partially banned the use of spray-applied asbestos containing building materials (ACBM) in new buildings. The United States government expanded these regulations in 1975 and 1978 to ban the use of all types of ACBM in new buildings.

Many structures built before 1962 have paint that contains lead (called lead-based paint). Lead from paint, chips, and dust can pose serious health hazards if not taken care of properly.

Based on the aerial photographs and available Sanborn mapping of the Site, the buildings on-Site were likely constructed in the late 1800s/early 1900s. It is unclear whether asbestos containing materials or lead-based paints were used during construction. An ACBM/Lead Based Paint Survey was not completed as part of this PESA since it was not in the scope of services.

Mercury Vapor

A comprehensive survey of possible mercury-containing materials was not part of the scope of services for this PESA and was not conducted.



Storage Tanks

Based on the 1949 Sanborn Fire Insurance Map, a “filling station” was located in the northwest portion of the Site. The “filling station” was depicted as a building and four apparent USTs in the 1949 Sanborn Map. However, in the next chronologically available Sanborn Map dated 1984, the “filling station” was located in the northwest portion of the Site, but the four apparent USTs were no longer depicted. No documentation such as UST registrations or closure certificates was available at RIDEM on June 6, 2006. A building was located in the same vicinity as the “filling station” depicted in the historical Sanborn Maps at the time of the site reconnaissance.

At the time of the site reconnaissance, VHB observed that there was no pavement or asphalt surface located adjacent to the former “filling station” to the south. The area to the south of the former “filling station” was observed to be a gravel surface.

Surface Conditions

The Site surface has been improved with two structures. VHB did not note any overt odors, staining, or stressed vegetation on the surface portions of the Site reconnaissance. VHB did observe solid waste throughout the exterior portions of the Site.

Adjacent Properties

Adjacent properties include a mixture of commercial and residential properties to the north, east, and west, and south. The Site is bounded on the south by Barton Street, on the east by Montgomery Street, on the north by Clay Street, and on the west by Broad Street.

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Conclusions

At the request of City of Pawtucket, Vanasse Hangen Brustlin, Inc. conducted an ASTM Phase I Environmental Site Assessment for a parcel of property located on the northeastern side of the intersection of Broad Street and Barton Street in Pawtucket, Rhode Island. The Site is located in both Pawtucket and Central Falls, Rhode Island. The southern portion of the Site is further defined by the City of Pawtucket Tax Assessor's Office Map as Plat 43B, Lots 602, 603, and 604 and the northern portion of the Site is defined as the City of Central Falls Tax Assessor's Office Map as Plat 1, Lot 309.

VHB completed a PESA with consideration to the scope and limitations of ASTM E 1527-05 and our proposal dated December 20, 2005, at the property located at Broad Street in Pawtucket and Central Falls, Rhode Island.

The following RECs were identified at the subject Site:

- **Former Filling Station** – A “filling station” building and four apparent USTs were depicted in historical Sanborn Fire Insurance mapping at the Site. No documentation such as UST registrations or closure certificates was available at RIDEM on June 6, 2006.
- **Historical Use as a Train Station** – Based on aerial photographs and Sanborn Fire Insurance mapping, the Site was used as a train station from the early 1900s to the 1970s.

Though not considered a REC in accordance with ASTM 1527-05 due to its limited nature, several areas of solid waste were observed through out the Site including food wrappers, cans and bottles, tires, plastic bags, and miscellaneous debris.

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527 of Pawtucket Plat 43B, Lots 602, 603, and 604 and Central Falls Plat 1, Lot 309, the property. Any exceptions to, or deletions from, this practice are described in Section 1. This assessment has revealed evidence of recognized environmental conditions with the property.



I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in §312.10 of 40 CFR 312. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the all appropriate inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

7

References

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List of Acronyms

| | |
|---------|--|
| ACM | Asbestos Containing Materials |
| AST | Above Ground Storage Tank |
| ASTM | American Society of Testing and Materials |
| BTEX | Benzene, Toluene, Ethyl benzene, Xylene |
| CERCLIS | Comprehensive Environmental Response Compensation and Liability Information System |
| COR | Corrective Action Sites |
| DEC | Direct Exposure Criteria |
| DPW | Department of Public Works |
| DWF | Double Wall Fiberglass |
| ERNS | Emergency Response Notification System |
| FINDS | Facility Index System |
| GEN | Generators |
| GW-# | Groundwater Category |
| IRA | Immediate Response Action |
| LBP | Lead Based Paint |
| LUST | Leaking Underground Storage Tanks |
| MADEP | Massachusetts Department of Environmental Protection |
| MCP | Massachusetts Contingency Plan |
| MTBE | Methyl Tertiary Butyl Ether |
| NLR | No Longer Regulated |
| NPL | National Priorities List |
| PCB | Poly Chlorinated Biphenyls |
| PSI | Preliminary Site Investigation |
| RAO | Response Action Outcome |
| RC | Reportable Concentration |
| RCRA | Resource Conservation and Recovery Act |
| RIDEM | Rhode Island Department of Environmental Management |
| S-# | Soil Category |
| SPILLS | State Spills List |
| STATE | State Sites |
| SWL | Solid Waste Landfills |



| | |
|-------|---|
| TPH | Total Petroleum Hydrocarbons |
| TSD | Transportation, Storage, Disposal Facility |
| USEPA | United States Environmental Protection Agency |
| UST | Underground Storage Tank |
| VOC | Volatile Organic Compounds |

Limitations



Broad Street Pawtucket and Central Falls, Rhode Island

- This report has been prepared for the sole and exclusive use of the Client. It is subject to and issued in connection with the Agreement and the provisions thereof. Any use or reliance upon information provided in this report, without the specific written authorization of the Client and VHB, shall be at the User's sole risk.
- In conducting this assessment, VHB has obtained and relied upon information from multiple sources to form certain conclusions regarding potential environmental issues at and in the vicinity of the subject property. Except as otherwise noted, no attempt has been made to verify the accuracy or completeness of such information.
- The objectives of the assessment described in this report were to assess the physical characteristics of the subject property with respect to overt evidence of past or present use, storage, and/or disposal of oil or hazardous materials, as defined in applicable state and federal environmental laws and regulations, and to gather information regarding current and past operations and environmental conditions at and in the vicinity of the subject property.
- Where access was denied or conditions obscured, VHB makes no report on such areas.
- No attempt has been made to assess the compliance status of any past or present Owner or Operator of the Site with any federal, state, or local laws or regulations.
- The findings, observations, and conclusions presented in this report are limited by the scope of services outlined in our Agreement, which reflects schedule and budgetary constraints imposed, by the Client for the current phase of environmental assessment. Furthermore, the assessment has been performed in accordance with generally accepted engineering practices and standards set forth in ASTM E 1527-05. No other warranty, expressed or implied, is made.
- The assessment presented in this report is based solely upon information gathered to date. Should further environmental or other relevant information be developed at a later date, Client should bring the information to the attention of VHB as soon as possible. Based upon an evaluation, VHB may modify the report and its conclusions.

- The EDR Environmental Data Resources Inc. (EDR) Radius Map with GeoCheck was conducted under the Notice of Disclaimer/Waiver of Liability included in the summary report.

Rail Yard, 280 Pine Street/Pawtucket Commuter Rail Facility Feasibility Study

Pawtucket,
Rhode Island

Prepared for: City of Pawtucket
Department of Planning and Redevelopment

Prepared by: **VHB**/Vanasse Hangen Brustlin, Inc.
Providence, Rhode Island

October 2006

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Prepared for: **City of Pawtucket
Department of Planning and Redevelopment**

Prepared by: ***VHB*/Vanasse Hangen Brustlin, Inc.
Providence, Rhode Island**

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Environmental Professional:

Michele S.W. Paul, LSP

October 2006

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Executive Summary

At the request of The City of Pawtucket (the Client), Vanasse Hangen Brustlin, Inc. (VHB) conducted a Phase I Environmental Site Assessment (PESA) for property located at 280 Pine Street in Pawtucket, Rhode Island (referred to herein as the Site). The Site is further defined by the City of Pawtucket Tax Assessor's Office as Assessor's Plat (A.P.) 44A, Lot 559.

The Client is a prospective purchaser of the Site and this PESA was conducted to identify the potential for Recognized Environmental Conditions (RECs) based on review of available environmental information and observations of overt evidence of a release or threat of a release of oil or hazardous materials (OHM) at and in the vicinity of the Site. The PESA was completed utilizing ASTM E 1527-05 "Standard Practice for Environmental Site Assessments for Commercial Real Estate" as guidance.

The site reconnaissance was performed by walking the Site with a designated employee of the Providence & Worcester Railroad Company. According to the Site contact, the adjacent property to the south, Roberts Chemical, used railroad tracks located on the subject Site to unload chemicals. These railroad tracks were not inspected as part of this PESA and a contact familiar with Roberts Chemical was not interviewed as part of this PESA. Other than the above assumption and those limitations expressly provided in Appendix A, completion of this PESA was not subject to significant assumptions, limitations, or exceptions to the ASTM E 1527-05 standard.

We have performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E 1527-05 of Pawtucket Plat 44A, Lot 559, the property. Any exceptions to, or deletions from, this practice are described above. This assessment revealed evidence of recognized environmental conditions in connection with the property.

Site Location and Vicinity Description

The Site is an approximately 270,756-square foot (7.521-acre) parcel located at 280 Pine Street in Pawtucket, Rhode Island. The Site is further identified by the City of Pawtucket Tax Assessor as Plat (A.P.) 44A, Lot 559. The Site is bounded on the north

by an Amtrak railroad line, on the west by Conant Street, on the south by Roberts Chemical and the Mineral Spring Cemetery, and on the east by Pine Street.

Site History Overview

Based on aerial photographs and Sanborn Fire Insurance mapping of the Site, it appears that a rail yard has operated at the Site since the late 1800s. During VHB's Site reconnaissance, the Site was observed to be an active rail yard used to unload railroad containers. A brick warehouse building, which according to the Pawtucket Tax Assessor's field card was built in 1900, was also observed.

Site Reconnaissance Observations

A site reconnaissance was conducted by VHB on the above-referenced property (the Site) on August 11, 2006 for any indications of RECs. The reconnaissance was conducted by walking the Site with a Site Contact, Mr. Bernard Cartier of the Providence & Worcester Railroad Company.

According to Mr. Cartier, the Site is currently leased and occupied by Pawtucket Transfer Operations, LLC. Mr. Cartier stated that the site tenants unload railroad containers with a crane that remains on-Site. According to Mr. Cartier, steel is the item most often unloaded at the Site. Mr. Cartier had no additional information as to other types of cargo that arrives at the Site. Mr. Cartier said that only the railroad containers get unloaded at the Site; the cargo does not get unloaded from the railroad containers at the Site. Additionally, the railroad trailers are not washed on-site, according to Mr. Cartier.

At the time of the Site visit, VHB observed that the cargo left the Site by tractor trailers that parked along Pine Street, which is located adjacent to the Site to the east.

VHB observed that the adjacent property to the south, Roberts Chemicals, had several railroad cars that were labeled as "hazardous materials". According to Mr. Cartier, the railroad tracks that Roberts Chemicals uses are part of the subject Site. At the time of the site reconnaissance, the railroad tracks used by Roberts Chemicals were separated from the remaining portion of the Site with a fence. Mr. Cartier had no information regarding the types of materials used at Roberts Chemicals. According to Mr. Cartier, Roberts Chemical has unloaded chemicals for approximately the last 5 to 6 years.

One building was located at the Site at the time of the site reconnaissance. The building was brick and was constructed on a concrete slab foundation with no basement. According to Mr. Cartier, the building was not heated and had not been



historically heated. At the time of the Site visit, the building was empty except for five unlabeled 55-gallon drums, a table, a large cardboard box, and some tools.

Approximately 10 to 12 years ago, the eastern portion of the building, adjacent to Pine Street, was demolished after being hit by a truck, according to Mr. Cartier. VHB observed that the slab foundation associated with the razed portion of the building was still present.

The majority of the Site was not paved and the subsurface soil was exposed. Solid waste was observed throughout the site and included an abandoned boat, numerous 55-gallon unlabeled drums, antifreeze containers, motor oil containers, abandoned tractor trailers, demolition debris, and stockpiles of apparent urban fill. Apparent petroleum staining was observed in the vicinity of several of the 55-gallon drums including staining on the subsurface soil.

Findings

VHB has completed a PESA with consideration to the scope and limitations of ASTM E 1527-05 and our proposal dated December 20, 2006 at the property located at 280 Pine Street in Pawtucket, Rhode Island.

The following RECs were identified at the subject Site:

- **Historical Use as a Rail Yard** – Based on historical aerial photographs and Sanborn Fire Insurance mapping, the Site has been used as a rail yard since the late 1800s.
- **Former 15,000-gallon Diesel UST** – A 15,000-gallon diesel underground storage tank (UST) was removed from the Site in 1998.
- **55-gallon drums** – Approximately ten 55-gallon drums were observed throughout the Site. The 55-gallon drums were closed and unlabeled. Therefore, the contents or former contents of the 55-gallon drums were not determined at the time of the Site visit; however, two of the 55-gallon drums had a red “flammable” sticker posted on the exteriors.
- **Solid Waste** – Solid waste including an abandoned boat, antifreeze containers, motor oil containers, abandoned tracker trailers, demolition debris, and stockpiles of apparent urban fill were observed throughout the Site. The majority of the solid waste observed at the Site was located on areas of bare soil.



- **Catch Basins** – Catch basins were observed along the railroad tracks located at the Site. According to the site contact, these catch basins discharged to Narragansett Bay.
- **Adjacent Properties** – Roberts Chemicals, which is located adjacent to the Site to the south, uses on-Site railroad tracks, according to the Site contact. At the time of the Site visit, railroad containers labeled “hazardous materials” were observed on the Roberts Chemical property. Likewise, according to a 2005 Site Investigation Report (SIR) prepared by Jacques Whitford Company at Roberts Chemical, arsenic, lead, and polynuclear aromatic hydrocarbons (PAH) were detected at concentrations in soil that exceeded applicable RIDEM regulatory criteria. Groundwater was located approximately 5 to 8 feet below grade at the property and flowed southeasterly, according to the 2005 SIR. Likewise, no volatile organic compounds (VOCs) were detected in groundwater collected from three groundwater monitoring wells located at the property. Based on October 11, 2005 correspondence from RIDEM, an Environmental Land Usage Restriction (ELUR) will be recorded on the deed for the entire Roberts Chemical property.

1

Introduction

Purpose and Scope of Work

At the request of the City of Pawtucket (the Client), Vanasse Hangen Brustlin, Inc. (VHB) conducted an ASTM Phase I Environmental Site Assessment (PESA) for the property located at 280 Pine Street in Pawtucket, Rhode Island (referred to herein as “the Site”). The Site is further defined by as the Pawtucket Tax Assessor Plat (A.P.) 44A, Lot 559.

The PESA was conducted to identify Recognized Environmental Conditions (RECs) based on review of available environmental information and observations to identify the potential for overt evidence of a release or threat of a release of oil or hazardous materials (OHM) at and in the vicinity of the Site.

The scope of services (December 20, 2005) for this PESA included: a historical review; a federal and state environmental database search; state and municipal file review; a Site reconnaissance; and interviews with people knowledgeable about the Site. The PESA was completed utilizing ASTM E 1527-05 “Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process” as guidance.

Assumptions, Limitations, and Exceptions

This PESA is subject to the terms of the agreement between VHB and the Client, and the Limitations included in **Appendix A**. The southern portion of the Site, occupied by Roberts Chemicals, was inaccessible and was not inspected as part of this PESA. A representative of Roberts Chemicals was not interviewed as part of this PESA.

2

Site Description

Site Location and Description

The Site is an approximately 7.5-acre parcel located at 280 Pine Street in Pawtucket, Rhode Island. A Site Location Map is included as **Figure 1**. The site is further identified by the Pawtucket Tax Assessor's Office as Plat 44A, Lot 559. According to the City of Pawtucket Tax Assessor's property description card, the Providence & Worcester Railroad Company owns the Site. Refer to **Figure 2** for a copy of the Tax Assessor's Map.

According to the City of Pawtucket Tax Assessor's property description card, a 7,500-square foot brick warehouse building, which was constructed in 1900, is located on the Site.

The Site is bounded on the north by an Amtrak railroad line, on the west by Conant Street, on the south by commercial buildings, and on the east by Pine Street.



Topography

The mean surface elevation of the Site is approximately 80 feet above the National Geodetic Vertical Datum of 1929 (USGS 7.5 minute series, Pawtucket, Rhode Island, Quadrangle). Based on USGS topographic mapping, the topography at the Site was generally flat.



Soils/Surficial Geology

According to the Soil Survey of Rhode Island (Rector 1981), soil at the Site is mapped as Urban Land (Ur), which consists mostly of sites for buildings, paved roads, and parking lots.

Bedrock Geology

According to the Bedrock Geology Map of Rhode Island (Hermes et al., 1994), the underlying bedrock is characterized as the Rhode Island Formation (Pnbr), which consists of gray to black, fine- to coarse-grained quartz arenite, litharanite, shale, and conglomerate, with minor beds of anthracite and meta-anthracite.

Groundwater

Groundwater in the vicinity of the Site is classified by the Rhode Island Department of Environmental Management (RIDEM) as GB. GB groundwater classification applies to groundwater resources that are known or presumed to be degraded. As such, GB groundwater is not suitable for public or private drinking water use. The closest GA classification area was located greater than ½ mile northwest of the Site.

According to the RIDEM Wellhead Protection Map for the Pawtucket Quadrangle (dated 2005), the Site is not located within wellhead protection area. The Site and surrounding area is connected to both municipal water and sewer.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology and characteristics of the soil. Based on topography, hydrology and previous environmental reports in the general vicinity of the Site, the inferred groundwater flow direction is to the east, towards the Blackstone River.

Based on 2005 Site Investigation Report prepared by Jacques Whitford Company, Inc. for the adjacent property to the south, Roberts Chemical, groundwater at Roberts Chemical flows to the southeast and is located approximately 5 to 8 feet below grade.

Wetlands

According to the RIDEM Geographic Information System Environmental Resource Map available online, no wetlands are located at the Site.

Surface Water

The Blackstone River is located approximately 2,000 feet east of the Site. According to the RIDEM Water Quality Regulations, the Blackstone River was classified as B1 {a}. Class B1 {a} surface water applies to waters designated for primary and secondary contact recreational activities and fish and wildlife habitat. Class B1 {a} waters should be suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation, and other agricultural



uses. Primary contact recreational activities may be impacted due to pathogens from approved wastewater discharges. A partial use designation applies to this waterway based on impacts from combined sewer overflow into the waterway.



Flood Plains

According to the Federal Emergency Management Agency Flood Insurance Rate Map for the City of Pawtucket, Rhode Island (Community Panel No. 440022 0002 D, Panel 2 of 3, January 3, 1986), the Site is located within a Zone C. Zone C areas are defined as areas of minimal flooding.

Description of Structures

According to the City of Pawtucket Tax Assessor's property description card, one 7,500-square foot warehouse building was located at the Site. Likewise, according to the property description card, the warehouse building was constructed in 1900.

3

Records Review

For historical information, VHB visited the Pawtucket City Hall, reviewed historical aerial photographs, and interviewed people knowledgeable of the Site. Information obtained is summarized below.

Chain of Title

A limited chain of title was on file at the Pawtucket City Hall for the Site. Previous property owners and their duration of ownership are summarized below. According to the Pawtucket Tax Assessor's Office, the subject Site, A.P. 44, Lot 559, historically included A.P. 44, Lots 292 and 460. As a result, the chain of title includes A.P. 44, Lots 292 and 460.

Table 1 – Chain of Title, Block 44A, Lot 559, Pawtucket, RI

| Owner (Block 44A, Lot 559) | Date |
|--|-------------|
| Providence & Worcester Railroad ½ and Conrail ½ | 1978 |
| Providence & Worcester ½ and Conrail ½ | 1980 |
| Providence & Worcester and Clinton Properties, Inc. | 1982 |
| Providence & Worcester Railroad Co. | 1982 |

Table 2 – Chain of Title, Block 44A, Lot 292, Pawtucket, RI

| Owner (Block 44A, Lot 292) | Date |
|--|-------------|
| Boston & Providence Railroad Corporation dropped into 559 | No Date |



Table 3 – Chain of Title, Block 44A, Lot 490, Pawtucket, RI

| Owner (Block 44A, Lot 490) | Date |
|---------------------------------|------|
| The Helad Hassasfeld Foundation | 1955 |
| David Friedman | 1967 |
| Valrayco Incorporated | 1968 |
| The Paramount Little Inc. | 1972 |

Environmental Liens

Records reviewed at the Pawtucket City Hall and/or other records reviewed during this investigation revealed no environmental liens or past environmental violations for the Site. A certified title search where environmental liens would be identified is not within the scope of services for this project. A title company can complete a full title and environmental lien search.

Local Government Agency Record Review

The Pawtucket municipal offices were visited on May 5, 2006 to obtain information regarding Site history and use, zoning, and OHM use, storage, release, and/or disposal practices that may have occurred at the Site. Information obtained during the review is summarized below.



Assessor's Office

The Site was identified by the Pawtucket Tax Assessor's Office as a 7.5-acres located at A.P. 44A, Lot 559. The current property owner listed for A.P. 44A, Lot 559 is the Providence and Worcester Railroad Company. The property field card and chain of title card are located in **Appendix B**.

Fire Prevention Office

VHB visited the Pawtucket Fire Department regarding underground storage tanks (USTs) and hazardous material storage at the Site. No information regarding OHM or USTs was on file for the subject Site.

Building/Zoning Department

According to the information obtained at the Zoning Department, the parcel identified as Pawtucket Tax Assessor A.P. 44A, Lot 559 was zoned as Commercial/Industrial.

Pawtucket Public Library

The *Atlas of Pawtucket*, which was part of the Pawtucket Public Library collection, was published in 1880 and was authored by Hopkins. The Site was depicted on a drawing in the *Atlas of Pawtucket*. No buildings were depicted at the Site. Railroad tracks were depicted as being located at the Site and the railroad tracks trended in an east-west direction. Additionally, the railroad tracks were labeled as the Providence Worcester Railroad.

Historical Maps

Sanborn Maps are periodically issued fire insurance maps dating back to the late 1800's that show the building use, USTs, ASTs, heating sources, building construction, and other useful information. According to Environmental Data Resources Inc. (EDR), Sanborn Fire Insurance Company maps were available for the subject property for the years 1890, 1902, 1923, 1949, and 1984. Copies of the Sanborn Maps are included in **Appendix C**.

1890 Sanborn Map

The Site was depicted as the New York, Providence, and Boston Railroad freight yard. A series of railroad tracks trending west-east were located throughout the site. A platform was depicted in the northern portion of the Site, which was depicted as being connected to a building labeled as a freight house. A building designated as the Geo. C. Stillman and Company General Storage Warehouse was located in the northern portion of the Site, adjacent to the railroad tracks.

The surrounding properties appeared to be primarily commercial businesses and factories. A small building labeled as a platform was depicted as being located at the adjacent property to the southeast. The Mineral Spring Cemetery was depicted adjacent to the subject site to the south.

1902 Sanborn Map

The Site was depicted as the New York, New Haven, and Hartford Railroad (N.Y.N.H. & H.R.R.) in the Sanborn Map, as opposed to the New York, Providence,



and Boston Railroad as it had previously in the 1890 Sanborn Map. The two buildings that were depicted in the 1890 Sanborn Map in the northern portion of the Site were present in the 1902 Sanborn Map. The two buildings appeared to occupy the same footprint as were depicted in the 1890 Sanborn Map. However, the northern building was depicted as the Pawtucket Freight Depot and the northwestern building was labeled as the Union building. Two smaller unlabeled building were also depicted in the northwestern portion of the Site.

The platform that was located on the adjacent southern property in the 1890 Sanborn Map was depicted in the 1902 Sanborn Map as part of the Narragansett Milling Company. The Narragansett Milling Company consisted on five buildings including a hay warehouse and an office. The Mineral Spring Cemetery was located adjacent to the Site to the south.

1923 Sanborn Map

A new building, previously not depicted in the Sanborn Maps, was located in the northwestern portion of the Site. This building was labeled as being owned by the N.Y.N.H. & H.R.R. The remaining portion of the Site appeared unchanged.

1949 Sanborn Map

A shed building was located adjacent to the building located in the northwestern portion of the Site. The remaining portion of the Site appeared unchanged.

1984 Sanborn Map

No significant changes were noted from the 1949 Sanborn Map.

Historical Topographic Maps

Historical topographic maps were reviewed through EDR and were available for the Site for the years 1949, 1970, 1975, and 1998. The railroad and a building located in the northern portion of the Site were both depicted in the historical topographic maps. The railroad and northern building remained unchanged in the USGS 7.5 minute series Pawtucket, Rhode Island Quadrangle reviewed for the years 1949, 1970, 1975, and 1998. Copies of the historical topographic maps are included in **Appendix D**.



Aerial Photography

VHB personnel reviewed aerial photographs dated 1939, 1951 to 1952, 1962, 1972, 1976, 1981, 1988, 1992 and 2003 for the Site and vicinity. Photograph interpretations are summarized below.

1939 Aerial Photograph

The Site appears to have been unoccupied with the railroad tracks and a rectangular-shaped building in the northern portion of the Site.

A cemetery and a series of buildings abutted the Site to the south.

1951 to 1952 Aerial Photograph

No significant changes were noted from the 1939 aerial photograph.

1962 Aerial Photograph

No significant changes were noted from the 1951 to 1952 aerial photograph

1972 Aerial Photograph

No significant changes were noted from the 1962 aerial photograph.

1976 Aerial Photograph

No significant changes were noted from the 1972 aerial photograph

1981 Aerial Photograph

No significant changes were noted from the 1976 aerial photograph

1988 Aerial Photograph

No significant changes were noted from the 1981 aerial photograph.

1992 Aerial Photograph

Rectangular-shaped containers or trailers were located in the northern portion of the Site.

2003 Aerial Photograph

The rectangular-shaped containers or trailers were no longer located at the Site.

Historical City Directories

City Street Directories were reviewed at the City of Pawtucket library in an effort to determine past uses of the property. The following occupants were listed in the Pawtucket City Directory for 280 Pine Street.

1908 Pawtucket City Directory



No occupant was listed for 280 Pine Street

1918 Pawtucket City Directory

No occupant was listed for 280 Pine Street

1928 Pawtucket City Directory

Occupant Listed for 280 Pine Street – New York, New Haven, and Hartford Railroad Freight Yard

1938 Pawtucket City Directory

No occupant was listed for 280 Pine Street

1948 Pawtucket City Directory

Occupant Listed for 280 Pine Street – New York, New Haven, and Hartford Railroad Freight Yard

1958 Pawtucket City Directory

Occupants Listed for 280 Pine Street – New York, New Haven, and Hartford Railroad Freight Yard, Republic Carloading Company, and Brown's Motor Express

1968 Pawtucket City Directory

Occupant Listed for 280 Pine Street – New York, New Haven, and Hartford Railroad Freight Yard, Knickerbocker Motor Lines, Inc., Republic Carload and Distributing Company Freight Forwarding

Previous Investigations/Assessments

VHB conducted a file review at the RIDEM on June 6, 2006. Information gathered from this assessment is discussed in the Regulatory File Search Section of this report. No previous investigations or assessments of this Site were available at the time of the RIDEM file review.

4

Regulatory File Search

A review of federal and state environmental databases and state and local records was conducted to help identify properties in the vicinity of the Site that have had a release or threat of release of oil and/or hazardous materials and may impact the environmental quality of the Site. VHB reviewed the following databases at the ASTM specified radii:

- National Priorities List (NPL); 1 mile - A database operated by the USEPA as an inventory of hazardous materials disposal sites that have been reported to the Federal government and been determined to be a priority for a Federally overseen cleanup.
- Resource Conservation and Recovery Information System (RCRIS) Transportation, Storage Disposal Facility (TSD); 0.5 mile - A database operated by the USEPA as an inventory of hazardous waste treatment, storage and disposal facilities.
- RCRIS Generators (GN); 0.25 mile - A database operated by the USEPA as an inventory of hazardous waste generators who store hazardous waste on their properties for periods not to exceed 90 days.
- RCRIS Corrective Action Sites (COR); 1 mile - A database operated by the USEPA as an inventory of hazardous waste treatment, storage and disposal facilities requiring a Federal oversight.
- RCRIS No Longer Regulated (NLR); 0.25 mile - A database operated by the USEPA as an inventory of former hazardous waste generators.
- Comprehensive Environmental Response Compensation and Liability Information System (CERCLIS) Sites; 0.5 mile - A database operated by the USEPA as an inventory of potential hazardous materials sites that have been reported to the Federal government.



- Emergency Response Notification System (ERNS); 0.25 mile - A database operated by the USEPA as an inventory of hazardous materials or petroleum spills.
- Facility Index System (FINDS); 0.25 mile - A database operated by the USEPA as an inventory of environmental permitted facilities (air, water, hazardous materials).
- State Hazardous Waste Sites (SHWS); 1 mile - A database operated by the Rhode Island Department of Environmental Management of properties regulated by the Rhode Island Remediation Regulations (hazardous materials and petroleum sites).
- Underground Storage Tanks (UST); 0.25 mile - A database of underground storage tank facilities.
- Leaking Underground Storage Tanks (LUST); 0.5 mile – A database of leaking underground storage tank facilities.
- Solid Waste Landfills (SWL); 0.5 mile - A database of active and closed solid waste landfills.

A summary of the database search information and maps indicating the locations of specific properties is provided in **Appendix C**. No COR sites were listed within the specified search distance. The database search identified one NPL site, one UST site, two CERCLIS sites, four FINDS sites, one SWL site, two LUST sites, two RCRA-SQG sites, and eleven SHWS sites.

Based on the findings of the EDR database review, VHB requested files from the following properties from the RIDEM Office of Technical & Customer Assistance on June 6, 2006.

- **Providence & Worcester Railroad-Subject Site** / 280 Pine Street – UST site
- **Parkway Realty Rental Property** / 265 Pine Street – UST facility
- **Pine Street Associates** / 258 Pine Street – Active SHWS facility
- **Lakeville Drill & Tapping** / 180 to 200 Weeden Street – RCRA facility
- **Eddies Auto Body** / 80 Conant Street – RCRA facility
- **North American Industries** / 180 Weeden Street – RCRA generator
- **Analytical Testing Service** / 180 Weeden Street – RCRA generator
- **Polymer Solutions** / 214 Weeden Street – RCRA generator
- **New England Paper Tube Company** / 173 Weeden Street – UST facility

Information obtained during the RIDEM review on significant properties in the area are described in the following section. Copies of the RIDEM files can be found in **Appendix D**. The remaining properties identified in the EDR database search are not anticipated to present a significant threat to the Site based on the distance from



the Site, direction with respect to inferred groundwater flow direction, and/or completed remedial status.



**Providence & Worcester Railroad / Subject Site
280 Pine Street, Pawtucket, RI**

The subject Site was identified as a UST facility in the EDR report. One 15,000-gallon No. 2 heating oil UST was permanently closed at the Site.

A November 1998 UST Closure Assessment Report prepared by GeoInsight, Inc. was observed in the RIDEM files. The UST was reportedly installed in 1983 and was used to store diesel fuel for trucks hauling trailers to and from the 280 Pine Street storage yard. Evidence of a release of diesel fuel was not noted at the time of the UST removal and two confirmatory soil samples were collected for TPH. TPH was not detected above laboratory reporting limits in one sample and the other soil sample had a concentration of TPH of 8.9 milligrams per kilogram (mg/kg). This concentration of TPH in soil is below the RIDEM regulatory criteria.

The former 15,000-gallon UST was located “near the north entrance of the property and immediately south of a concrete pad (approximately 4 feet wide by 4 feet long)”, according to the 1998 UST Closure Assessment Report.



**Parkway Realty Rental Property
265 Pine Street, Pawtucket, RI**

This UST facility, which is located approximately 300 feet south of the subject Site, was identified as having two USTs that had been permanently closed, according to the EDR report. One tank was a 1,000-gallon No. 2 heating oil UST and the other was a 1,500-gallon No. 2 heating oil UST.

According to files reviewed at RIDEM, one 1,500-gallon No. 2 oil UST was removed from the property on May 19, 2003. No information regarding whether or not a release of petroleum was observed at the time of the UST removal was available at the time of the RIDEM file review.



**Pine Street Associates
258 Pine Street, Pawtucket, RI**

According to the EDR report, this property was active on the State Hazardous Waste List. The property is located adjacent to the subject Site to the south.

According to the July 2005 Remedial Action Work Plan prepared to Jacques Whitford for the property, soil throughout the property contained concentrations of arsenic,

lead, and PAHs that exceeded the R-DEC and I/C-DEC. Based on regulatory exceedances, an Environmental Land Use Restriction (ELUR) was placed on the property, the property was capped, and a Soil Management Plan was developed to address potential future excavation.



Lakeville Drill & Tapping
180 to 200 Weeden Street, Pawtucket, RI

This property was listed as a RCRA generator and according to RIDEM files. Lakeville Drill & Tapping used “Lafayette No. 3”, which, according to the RCRA file, “is a complex mixture of petroleum oil and sodium sulfonate”. The property is located approximately 800 feet west of the subject Site. No additional information regarding the types of waste generated at the property was documented at the time of the file review.



Eddies Auto Body
80 Conant Street, Pawtucket, RI

Eddies Auto Body generated less than 1,000 kilograms per month (kg/mo) of hazardous waste. The types of waste were not documented in RIDEM files reviewed at the time of the file review. Eddies Auto Body is located approximately 1,000-feet west of the subject Site.



North American Industries
180 Weeden Street, Pawtucket, RI

No RCRA files were available for this property at the time of the RIDEM file review. North American Industries is located approximately 800 feet west of the subject Site.



Analytical Testing Service
180 Weeden Street, Pawtucket, RI

According to RIDEM files, the facility generated less than 100 kg/mo of ignitable, corrosive, reactive, and toxicity characteristic wastes. However, the names or types of waste generated were not documented in files reviewed at the time of the RIDEM file review. Analytical Testing Service is located approximately 800 feet west of the subject Site.



Polymer Solutions
214 Weeden Street, Pawtucket, RI

According to files reviewed at RIDEM, Polymer Solutions generated less than 1,000 kg/mo of hazardous waste including non-halogenated organics such as acetone, inorganic salts, and hexane. Polymer Solutions is located approximately 800 feet west of the Site. On December 7, 2005, RIDEM issued the property a Letter of Non-Compliance because the facility did not have an EPA identification number. On December 7, 2006, RIDEM issued the facility a Letter of Compliance.



New England Paper Tube Company
173 Weeden Street, Pawtucket, RI

According to files reviewed at the time of the RIDEM file review, a 6,000-gallon isopropanol UST is permanently out of use at the property, which is located approximately 800 feet west of the Site. No record of the removal of the 6,000-gallon isopropanol UST was observed by VHB at the time of the file review. A UST Certificate of Closure dated May 23, 1990 was observed in the files and one 10,000-gallon alcohol UST, one 2,000-gallon diesel UST, and one 1,000-gallon gasoline UST were removed from the property.

Other Sites Identified in the EDR Radius Report

The sites listed in **Table 1** are properties appearing in the database search located within the vicinity of the subject Site. Based upon a review of RIDEM records, and the distance and direction of groundwater flow from the subject Site, these properties do not appear to present a significant environmental hazard to the subject Site.



Table 4 – Nearby Listed Properties

| Property Name | Property Type | Address | Distance and Direction |
|--------------------------|----------------------|-------------------|-------------------------------|
| Providence Metallizing | CORRACTS | 51 Fairlawn Ave | ½-1 mile WSW |
| Globe Narrow Fabrics | CERCLIS, RCRA | 179 Conant Street | 1/8-1/4-mile W |
| M&F Case Co | RCRA | 335 Barton Street | 0-1/8-mile N |
| Aafco Incorporated | RCRA | 248 Pine Street | 1/8-1/4-mile E |
| Conant Street Mill | SHWS | 200 Conant Street | 1/8-1/4-mile W |
| Maaco Auto Painting | SHWS | 501 Main Street | 1/8-1/4-mile SE |
| Standard Management Corp | SHWS | 354 Pine Street | 1/8-1/4-mile N |
| Woodlawn Sunoco | LUST | 75 Mineral Spring | 1/8-1/4-mile S |
| Paramount Cards | SHWS, LUST | 400 Pine Street | 1/4-1/2-mile NW |

* According to the EDR report, the property was not mapped due to poor or inaccurate information.

5

Site Reconnaissance

VHB conducted a Site Reconnaissance on August 11, 2006 that included observing the property for overt evidence of oil and hazardous materials. Adjacent properties were also observed from the subject Site and from exterior areas accessible to the general public. A Site Plan depicting pertinent Site features is provided as **Figure 3**. Photographs taken during the site reconnaissance are provided in **Appendix E**.

General Observations

Site reconnaissance was conducted by Ms. Emily Scurso and Mr. David Wilcock of VHB on August 11, 2006 for any indications of RECs as defined by ASTM E 1527-05. The reconnaissance was conducted by walking the Site with a Site representative, Mr. Bernard Cartier, Director of Engineering for the Providence & Worcester Railroad Company.

According to Mr. Cartier, the Site is currently leased and occupied by Pawtucket Transfer Operations, LLC. Mr. Cartier stated that the site tenants unload railroad containers with a crane that remains on-Site. According to Mr. Cartier, steel is the item most often unloaded at the Site. Mr. Cartier had no additional information as to other types of cargo that arrive at the Site. Mr. Cartier said that only the railroad containers get unloaded at the Site; the cargo does not get unloaded from the railroad containers at the Site. Additionally, the railroad trailers are not washed on-site, according to Mr. Cartier.

At the time of the Site visit, VHB observed that the cargo left the Site by tractor trailers that parked along Pine Street, located adjacent to the Site to the east.

At the time of the Site visit, VHB observed that the adjacent property to the south, Roberts Chemicals, had several railroad cars that were labeled as “hazardous materials”. According to Mr. Cartier, the railroad tracks that Roberts Chemicals uses are part of the subject Site. At the time of the site reconnaissance, the railroad tracks used by Roberts Chemicals were separated from the remaining portion of the Site with a fence. Mr. Cartier had no information regarding the types of materials used at

Roberts Chemicals. According to Mr. Cartier, Roberts Chemical has unloaded chemicals for approximately the last 5 to 6 years.

Buildings

One building was located at the Site at the time of the site reconnaissance. The building was brick and was constructed on a concrete slab foundation with no basement. According to Mr. Cartier, the building was not heated and had not been historically heated. At the time of the Site visit, the building was empty except for five 55-gallon drums, a table, a large cardboard box, and some tools. The 55-gallons drums observed in the building were not labeled and were closed.

Approximately 10 to 12 years ago, the eastern portion of the building, adjacent to Pine Street, was demolished after being hit by a truck, according to Mr. Cartier. VHB observed that the slab foundation associated with the razed portion of the building was still present.

Site Utilities

The Site was serviced by municipal water and sewer provided by the City of Pawtucket. Overhead electrical service was provided.

Drywells, Floor Drains and Sumps

During the site reconnaissance VHB did not observe any drywells, floor drains, or sumps within any of the building structures located on-Site.

VHB encountered catch basins located throughout the property. The catch basins were observed to be located adjacent to the railroad tracks located throughout the Site. According to Mr. Cartier, these catch basins discharged to the Narragansett Bay.

Hazardous Materials/Petroleum Products Storage and Handling

VHB observed numerous 55-gallon drums throughout the Site. Most of the 55-gallon drums were unlabeled and according to the site contact, Mr. Cartier, the contents and/or former contents of the 55-gallon drums were not known. Two of the 55-gallon drums observed had red placards that read “flammable” on the 55-gallon drums. VHB did not determine whether or not the 55-gallon drums contained contents. Staining was observed on and around many of the 55-gallon drums.

Likewise, stressed vegetation was also observed around one of the 55-gallon drums located in a grassy area.

Polychlorinated Biphenyls

At the time of the site reconnaissance, VHB did not observe any evidence indicating the presence of polychlorinated biphenyls at the site such as transformers or electrical equipment.

According to the site contact, Mr. Cartier, pole mounted transformers were formerly located along Pine Street adjacent to the Site. Likewise, according to Mr. Cartier, transformers were formerly located in the warehouse building. At the time of the Site visit, VHB did not observe any staining or cracks in the concrete floor of the warehouse building.

Asbestos Containing Materials/Lead Based Paint

The 1973 National Emission Standards for Hazardous Air Pollutants partially banned the use of spray-applied asbestos containing building materials (ACBM) in new buildings. The United States government expanded these regulations in 1975 and 1978 to ban the use of all types of ACBM in new buildings.

Many structures built before 1962 have paint that contains lead (called lead-based paint). Lead from paint, chips, and dust can pose serious health hazards if not taken care of properly.

Based on the aerial photographs and available Sanborn mapping of the Site, the buildings on-Site were likely constructed in the late 1800s/early 1900s. It is unclear whether asbestos containing materials or lead-based paints were used during construction. An ACBM/Lead Based Paint Survey was not completed as part of this PESA since it was not in the scope of services.

Mercury Vapor

A comprehensive survey of possible mercury-containing materials was not part of the scope of services for this PESA and was not conducted.

Storage Tanks

At the time of the Site visit, no fill or vent pipes associated with an underground storage tank (UST) were observed. Likewise, no aboveground storage tanks (AST)



were observed. According to Mr. Cartier, he was not aware of any former or current storage tanks located at the Site.

According to a 1998 Closure Assessment Report, a 15,000-gallon diesel UST was permanently closed at the Site. No evidence of this former UST was observed at the time of the site reconnaissance.

Surface Conditions

The Site surface was improved with a warehouse building and multiple railroad tracks.

VHB did not note any overt odors. Staining and stressed vegetation was observed on the surface portions of the Site in the vicinity of 55-gallons drums located throughout the Site.

Solid waste was observed throughout the site and included an abandoned boat, numerous 55-gallon drums, antifreeze containers, motor oil containers, abandoned tractor trailers, demolition debris, and stockpiles of apparent urban fill.

Adjacent Properties

The Site is bounded on the north by an Amtrak railroad line, on the west by Conant Street, on the south by Roberts Chemical and the Mineral Spring Cemetery, and on the east by Pine Street.

6

Conclusions

At the request of City of Pawtucket, Vanasse Hangen Brustlin, Inc. conducted an ASTM Phase I Environmental Site Assessment for a parcel of property located at 280 Pine Street, Pawtucket, Rhode Island. The Site is further defined by the City of Pawtucket Tax Assessor's Office Map as Plat 44A, Lot 559.

VHB completed a PESA with consideration to the scope and limitations of ASTM E 1527-05 and our proposal dated December 20, 2005, at the property located at 280 Pine Street in Pawtucket, Rhode Island.

The following RECs were identified at the subject Site:

- **Historical Use as a Rail Yard** – Based on historical aerial photographs and Sanborn Fire Insurance mapping, the Site has been used as a rail yard since the late 1800s.
- **Former 15,000-gallon Diesel UST** – A 15,000-gallon diesel underground storage tank (UST) was removed from the Site in 1998.
- **55-gallon drums** – Approximately ten 55-gallon drums were observed throughout the Site. The 55-gallon drums were closed and unlabeled. Therefore, the contents or former contents of the 55-gallon drums were not determined at the time of the Site visit; however, two of the 55-gallon drums had a red “flammable” stickers posted on their exteriors.
- **Solid Waste** – Solid waste including an abandoned boat, antifreeze containers, motor oil containers, abandoned tracker trailers, demolition debris, and stockpiles of apparent urban fill were observed throughout the Site. The majority of the solid waste observed at the Site was located on areas of bare soil.
- **Catch Basins** – Catch basins were observed along the railroad tracks located at the Site. According to the site contact, these catch basins discharge to Narragansett Bay.



- **Adjacent Properties** – Roberts Chemicals, which is located adjacent to the Site to the south, uses on-Site railroad tracks, according to the Site contact. At the time of the Site visit, railroad containers labeled “hazardous materials” were observed on the Roberts Chemical property. Likewise, according to a 2005 Site Investigation Report (SIR) prepared by Jacques Whitford Company at Roberts Chemical, arsenic, lead, and polynuclear aromatic hydrocarbons (PAH) were detected at concentrations in soil that exceeded applicable RIDEM regulatory criteria. Groundwater was located approximately 5 to 8 feet below grade at the property and flowed southeasterly, according to the 2005 SIR. Likewise, no volatile organic compounds (VOCs) were detected in groundwater collected from three groundwater monitoring wells located at the property. Based on October 11, 2005 correspondence from RIDEM, an Environmental Land Usage Restriction (ELUR) will be recorded on the deed for the entire Roberts Chemical property.

7

References

Pawtucket Tax Assessor, August 2006.

Pawtucket Zoning/Building Department, August 2006.

Pawtucket Fire Department, May 2006.

Environmental Data Resources (EDR™) Radius Map with Geocode, April 17, 2006.

Federal Emergency Management Agency Flood Insurance Rate Map for the City of Pawtucket, Rhode Island (Community Panel No. 440022 0002 D, Panel 2 of 3, January 3, 1986)

Hermes, O.D., L.P. Gromet and D.P. Murray. Bedrock Geologic Map of Rhode Island, 1994.

RIDEM Groundwater Classification Map, 1993.

RIDEM Wellhead Protection Areas. 1997.

Rector, Dean D. 1981. Soil Survey of Rhode Island. US Department of Agriculture, Soil Conservation Service in cooperation with the Rhode Island Agricultural Experiment Station.

University of New Hampshire Dimond Library, Topographic Maps: 1939, 1944 USGS 7.5 minute series Fall River, MA-RI Quadrangle.

Statewide Planning Program Aerial Photographs dated 1939, 1951-1952, 1962, 1972, 1976, 1981, 1988, 1997 and 2003.



List of Acronyms

| | |
|---------|--|
| ACM | Asbestos Containing Materials |
| AST | Above Ground Storage Tank |
| ASTM | American Society of Testing and Materials |
| BTEX | Benzene, Toluene, Ethyl benzene, Xylene |
| CERCLIS | Comprehensive Environmental Response Compensation and Liability Information System |
| COR | Corrective Action Sites |
| DEC | Direct Exposure Criteria |
| DPW | Department of Public Works |
| DWF | Double Wall Fiberglass |
| ERNS | Emergency Response Notification System |
| FINDS | Facility Index System |
| GEN | Generators |
| GW-# | Groundwater Category |
| IRA | Immediate Response Action |
| LBP | Lead Based Paint |
| LUST | Leaking Underground Storage Tanks |
| MADEP | Massachusetts Department of Environmental Protection |
| MCP | Massachusetts Contingency Plan |
| MTBE | Methyl Tertiary Butyl Ether |
| NLR | No Longer Regulated |
| NPL | National Priorities List |
| PCB | Poly Chlorinated Biphenyls |
| PSI | Preliminary Site Investigation |
| RAO | Response Action Outcome |
| RC | Reportable Concentration |
| RCRA | Resource Conservation and Recovery Act |
| RIDEM | Rhode Island Department of Environmental Management |
| S-# | Soil Category |
| SPILLS | State Spills List |
| STATE | State Sites |
| SWL | Solid Waste Landfills |



| | |
|-------|---|
| TPH | Total Petroleum Hydrocarbons |
| TSD | Transportation, Storage, Disposal Facility |
| USEPA | United States Environmental Protection Agency |
| UST | Underground Storage Tank |
| VOC | Volatile Organic Compounds |

Limitations



**280 Pine Street
Pawtucket, Rhode Island**

- This report has been prepared for the sole and exclusive use of the Client. It is subject to and issued in connection with the Agreement and the provisions thereof. Any use or reliance upon information provided in this report, without the specific written authorization of the Client and VHB, shall be at the User's sole risk.
- In conducting this assessment, VHB has obtained and relied upon information from multiple sources to form certain conclusions regarding potential environmental issues at and in the vicinity of the subject property. Except as otherwise noted, no attempt has been made to verify the accuracy or completeness of such information.
- The objectives of the assessment described in this report were to assess the physical characteristics of the subject property with respect to overt evidence of past or present use, storage, and/or disposal of oil or hazardous materials, as defined in applicable state and federal environmental laws and regulations, and to gather information regarding current and past operations and environmental conditions at and in the vicinity of the subject property.
- Where access was denied or conditions obscured, VHB makes no report on such areas.
- No attempt has been made to assess the compliance status of any past or present Owner or Operator of the Site with any federal, state, or local laws or regulations.
- The findings, observations, and conclusions presented in this report are limited by the scope of services outlined in our Agreement, which reflects schedule and budgetary constraints imposed, by the Client for the current phase of environmental assessment. Furthermore, the assessment has been performed in accordance with generally accepted engineering practices and standards set forth in ASTM E 1527-00. No other warranty, expressed or implied, is made.
- The assessment presented in this report is based solely upon information gathered to date. Should further environmental or other relevant information be developed at a later date, Client should bring the information to the attention of VHB as soon as possible. Based upon an evaluation, VHB may modify the report and its conclusions.

Appendix A

- The EDR Environmental Data Resources Inc. (EDR) Radius Map with GeoCheck was conducted under the Notice of Disclaimer/Waiver of Liability included in the summary report.

C

Appendix C: Structural Backup

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May 24, 2006

VHB, Inc.
99 High Street, 10th Floor
Boston, MA 02110

Attention: David Wilcock
Project Manager

Subject: **Pawtucket / Central Falls Commuter Rail Facility Feasibility Study
and Site Analysis**
VHB Project No. 09736.00
Report for concrete testing by NDT Corp.

Dear Mr. Wilcock,

Please find 2 copies of the report for the non-destructive testing of the concrete floor slabs at the Pawtucket/Central Falls station performed by NDT Corporation of Worcester, MA. Also enclosed is an invoice from NDT Corporation for their services.

The non-destructive ground penetrating radar (GPR) and sonic/ultrasonic testing was performed on April 24, 2006. The main areas of concern were the concrete floor slabs on the waiting room level of the existing station. These areas consisted of the waiting room and the north and south passage areas. The north passage has a second level, which was also tested. The tested areas were limited due to debris inside the building and some test results were limited for portions of the slab where the floor tiles were debonded from the concrete floor slabs.

The test results indicated an average slab thickness on the waiting room level of 7 1/2" to 8 1/2". Concrete strength in this area ranged from 3500 psi to 5900 psi. The testing did indicate some areas of the slab are in poor condition. The testing did indicate the presence of reinforcement in the concrete slab, but the exact size and spacing is unknown. The original structural drawings from 1916 are not available for the existing station. However, the concrete strength of the slabs indicated from the non-destructive testing in all likelihood meets or exceeds the original design values.

In general, test results indicate the existing floor slabs to be serviceable. Some localized repair of water-damaged areas of the slab would be required. If the project progresses beyond the feasibility stage, we recommend that a complete visual inspection of the floor slabs be conducted after removal of the existing floor tiles and debris from the top of the slab and removal of the fireproofing below the slab. In addition, we recommend additional non-destructive and destructive testing be conducted to obtain a complete condition assessment of the slabs and to obtain information about the size and spacing of

reinforcement (this may be unnecessary if the existing plans can be found). This information could then be used to develop plans to repair the damaged areas of the concrete floor slabs.

Please call if you have any questions.

Very truly yours,

URS Corporation



Douglas E. Peterson, P.E.
Project Manager

Enclosures

Cc Project File 10160343

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Project: Pawtucket / Central Falls Feasibility Study
Description: Station Building - Member Inspection Summary

Page: _____ of: _____
Job No: 10160343
Sheet No: _____ of: _____
Calc By: SEK Date: 06/14/06
Chk'd By: JPC Date: 06/16/06

Figure 2-15 \\mabos\projects\09736.00\reports\06 Structural_Eval\[rating summary.xls]Sheet1

| Pawtucket/Central Falls | | | | | | | | | |
|---------------------------|----------------|--------------------|---------------------|-------------------------|------------------|------------------|--------------|--|--|
| Member Inspection Summary | | | | | | | | | |
| Member | Overall Rating | Rating Description | Flange plate rating | Flange/Web Angle rating | Web plate rating | Stiffener Rating | Rivet Rating | Additional Member Comments | |
| * G1A | 5 | Fair | - | - | - | - | - | Visible girder corrosion and concrete damage at wall/girder connection | |
| G1B | 4 | Poor | 4 | 5 | 5 | 3 | 4 | Bottom flange and angles heavily corroded | |
| G1C | 5 | Fair | - | 5 | 5 | 4 | 5 | | |
| * G2A | 4 | Poor | 4 | - | - | - | - | Corrosion and concrete slab water damage | |
| G2B | 5 | Fair | 5 | 5 | 4 | 3 | 3 | | |
| G2C | 4 | Poor | 4 | 5 | 5 | 2 | 4 | heavy corrosion | |
| * G3A | 5 | Fair | - | - | - | - | - | Corrosion of stiffener angles | |
| G3B | 6 | Satisfactory | 6 | 6 | 6 | 6 | 5 | | |
| G3C | 5 | Fair | - | 5 | 5 | 6 | 5 | | |
| * G4A | 5 | Fair | - | - | - | - | - | | |
| G4B | 5 | Fair | 5 | 5 | 5 | 5 | 4 | | |
| G4C | 4 | Poor | - | 4 | 5 | 5 | 3 | Bottom Flange damage and warping - heavy corrosion | |
| * G5A | 4 | Poor | - | - | - | - | - | Heavy flange corrosion | |
| G5B | 5 | Fair | 4 | 4 | 5 | 5 | 4 | | |
| G5C | 4 | Poor | - | 4 | 5 | 5 | 4 | Bottom Flange damage - heavy corrosion | |
| * G6A | 5 | Fair | 5 | - | - | - | - | Utility hole in web | |
| G6B | 4 | Poor | 4 | 3 | 4 | 3 | 3 | Water damage and holes in concrete slab above girder | |
| G6C | 5 | Fair | 5 | 4 | 4 | 5 | 3 | Bottom flange and rivet pitting, stiffener and web lamination | |
| * G7A | 5 | Fair | 5 | - | - | - | - | Multiple utility holes | |
| G7B | 4 | Poor | 4 | 4 | 5 | 4 | 4 | | |
| G7C | 5 | Fair | 5 | 5 | 5 | 4 | 4 | Utility hole in web plate, Bottom flange plate and rivet pitting | |
| * G8A | 2 | CRITICAL | 2 | - | - | - | - | 24" length of flange plate at midspan of girder with 100% section loss | |
| G8B | 4 | Poor | 4 | 5 | 2 | 5 | 2 | Heavy pitting | |
| G8C | 4 | Poor | 4 | 4 | 5 | 2 | 2 | Bottom Flange plate warping and section loss | |
| C1A | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | | |
| C1C | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | | |
| C2A | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | | |
| C2C | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | | |
| C3A | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | | |
| C3C | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | | |
| C4A | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | | |
| C4C | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | | |



Project: Pawtucket / Central Falls Feasibility Study
Description: Station Building - Member Inspection Summary

Page: _____ of: _____
Job No: 10160343
Sheet No: _____ of: _____
Calc By: SEK Date: 06/14/06
Chk'd By: JPC Date: 06/16/06

Figure 2-15

\\mabos\projects\09736.00\reports\06 Structural_Eval\[rating summary.xls]Sheet1

| Pawtucket/Central Falls | | | | | | | | |
|---------------------------|----------------|--------------------|---------------------|-------------------------|------------------|------------------|--------------|----------------------------|
| Member Inspection Summary | | | | | | | | |
| Member | Overall Rating | Rating Description | Flange plate rating | Flange/Web Angle rating | Web plate rating | Stiffener Rating | Rivet Rating | Additional Member Comments |
| | | | | | | | | |
| C5A | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | |
| C5C | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | |
| | | | | | | | | |
| C6A | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | |
| C6C | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | |
| | | | | | | | | |
| C7A | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | |
| C7C | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | |
| | | | | | | | | |
| C8A | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | |
| C8C | 6 | SATISFACTORY | 6 | 6 | 6 | 6 | 6 | |

CONDITION RATING GUIDE

- N NOT APPLICABLE
- 9 EXCELLENT
- 8 VERY GOOD
- 7 GOOD
- 6 SATISFACTORY
- 5 FAIR
- 4 POOR
- 3 SERIOUS
- 2 CRITICAL
- 1 "IMMINENT" FAILURE
- 0 FAILED

* THESE GIRDERS INSPECTED FROM TRACK LEVEL ONLY

** INSPECTIONS CONDUCTED 5/17/2006 to 5/19/2006

Figure C-1 Water Damage To Underside Of Slab



Figure C-2 Elevation Of Girder G1



Figure C-3 Corrosion To Girder And Slab Due To Water Damage



Figure C-4 Typical Corrosion Damage



Figure C-5 Heavy Pitting Of Bottom Flange And Rivets Over Tracks

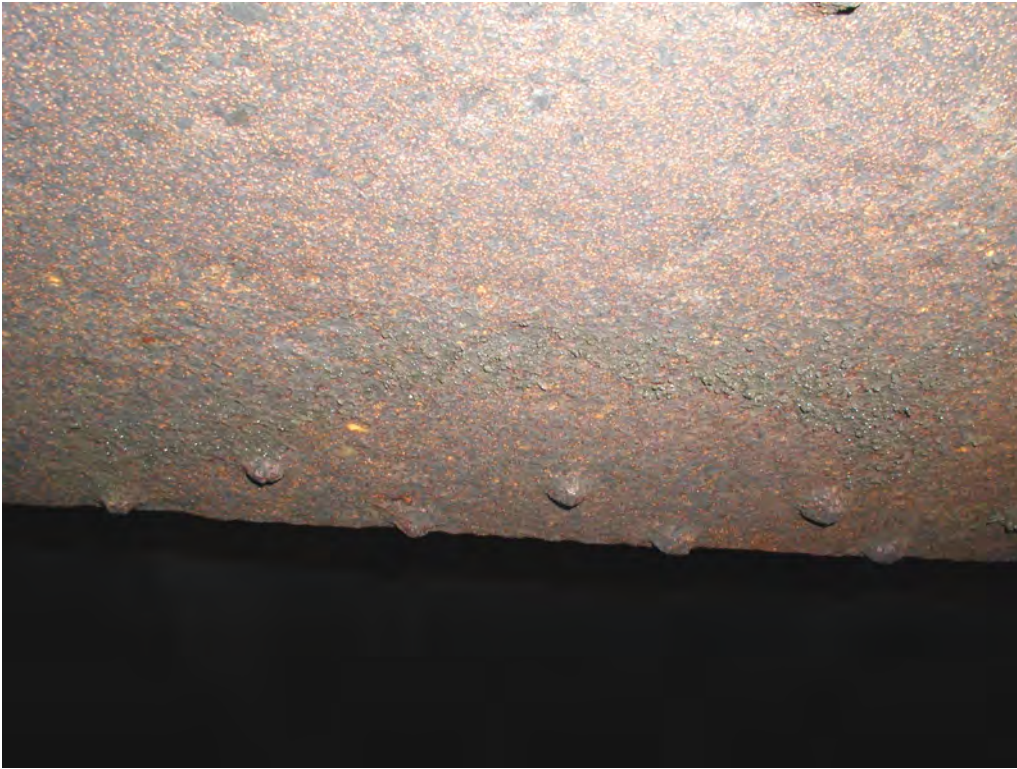


Figure C-6 Heavy Corrosion To Web – Delamination To Web Stiffener



Figure C-7 Typical Damage To Web, Stiffeners, Flange Angles, And Rivets



Figure C-8 Typical Deterioration And Damage To Bottom Flange



Figure C-9 Damage To Bottom Flange



Figure C-10 Corrosion Of Girder Connection At Column



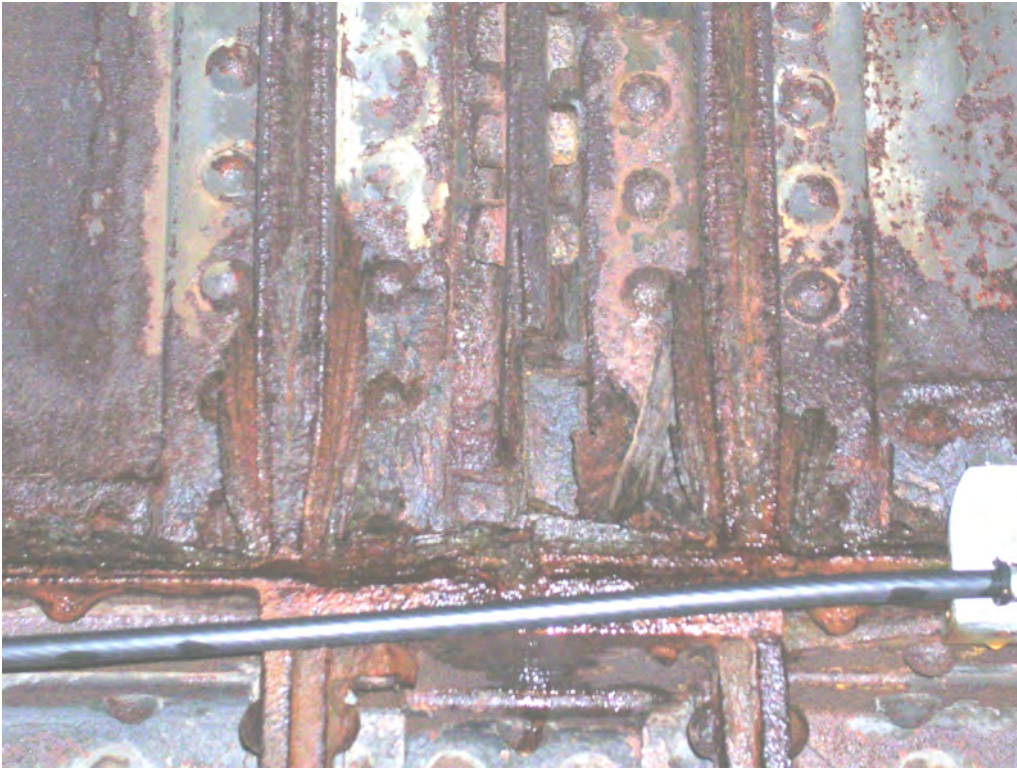
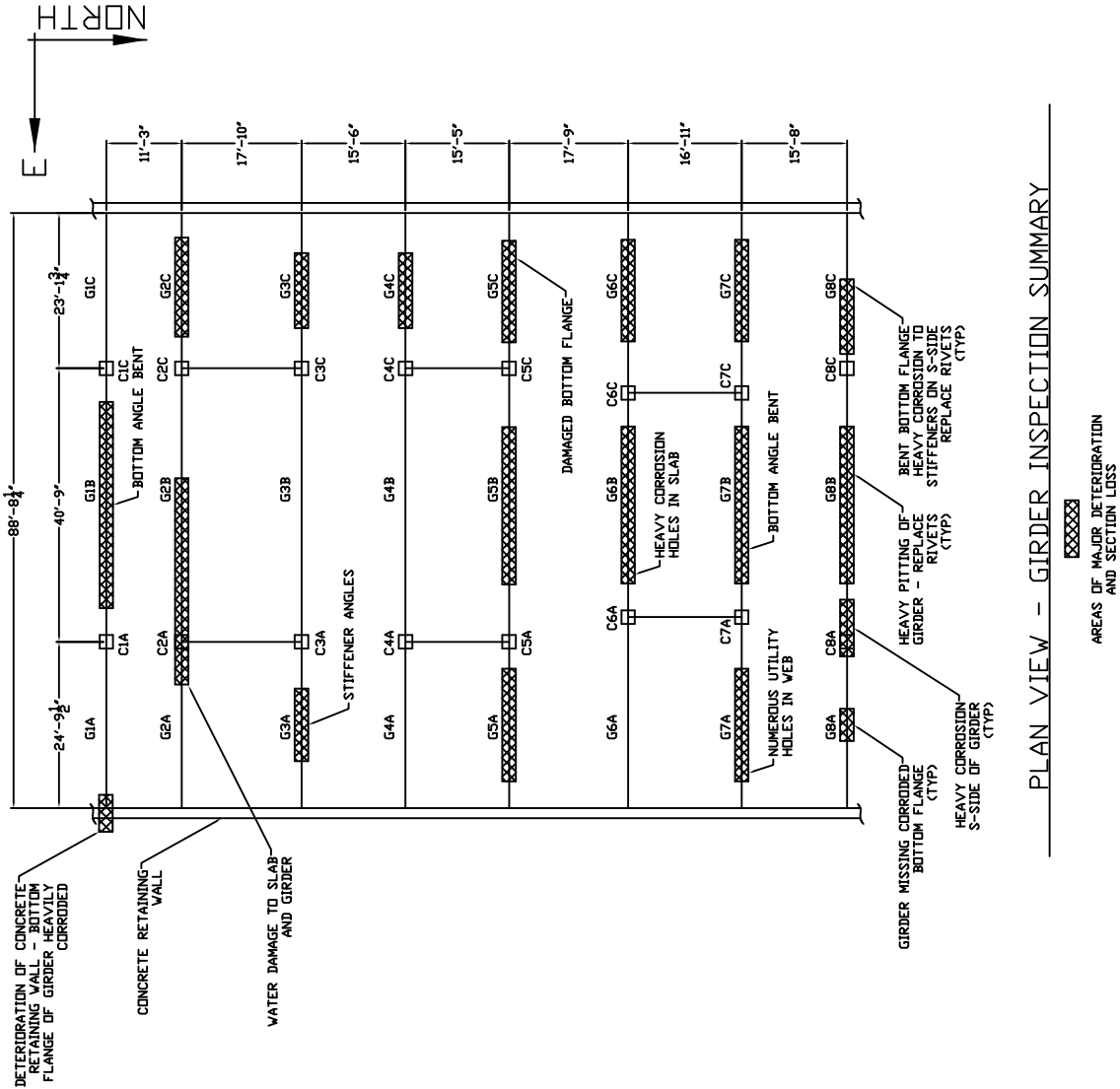
Figure C-11 Detail Of Girder Connection At Column**Figure C-12 Missing Bottom Flange**

Figure C-13 Corrosion Of Vertical Web Stiffeners

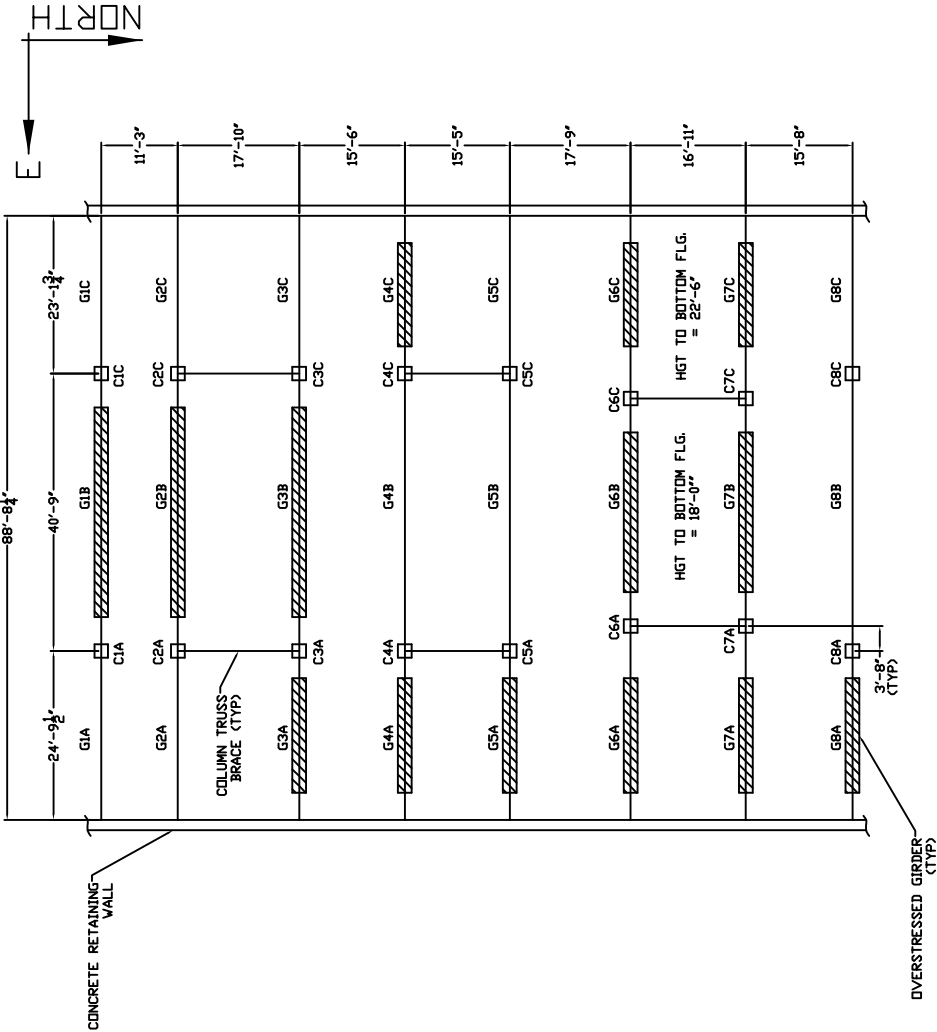


Figure C-14 Excavation Near Existing Column Footing





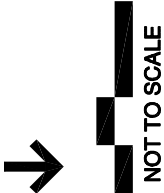
PLAN VIEW - GIRDER INSPECTION SUMMARY



PLAN VIEW - OVERSTRESSED SUPPORT GIRDERS

Pawtucket/Central Falls Commuter Rail Facility
Feasibility Study and Site Analysis

Figure 2-17
Overstressed Girders



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NONDESTRUCTIVE TESTING
INVESTIGATION

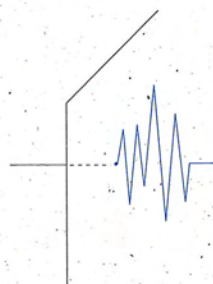
GRADE CROSSINGS RAILROAD STATION

PAWTUCKET-CENTRAL FALLS,
RHODE ISLAND

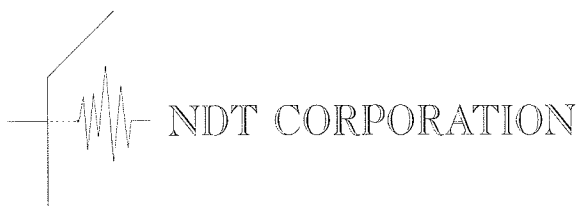
Prepared for

URS CORPORATION

MAY 2006



NDT CORPORATION



May 22, 2006

Mr. Doug Peterson, P.E.
URS Corporation
38 Chauncey Street
Boston, Massachusetts 02111

Dear Mr. Peterson:

NDT Corporation conducted nondestructive ground penetrating radar (GPR) and sonic/ultrasonic testing of selected floor slabs at the Grade Crossings Railroad Station in Pawtucket-Central Falls, Rhode Island. The survey was conducted on April 24, 2006. The objective of this investigation was to evaluate the reinforcing, thickness, and general condition of the concrete floor slabs.

This report presents the results and findings of our investigation. If you have any questions or require additional information, call the undersigned at 508-754-0417.

Sincerely,
NDT Corporation

A handwritten signature in cursive script that reads "Paul S. Fisk".

Paul S. Fisk

Table of Contents

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| 4.0 | DISCUSSION OF RESULTS | page 3 |

FIGURES

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|------------|---|
| APPENDIX 1 | GPR METHOD OF INVESTIGATION |
| APPENDIX 2 | SONIC/ULTRASONIC NONDESTRUCTIVE TESTING |
| APPENDIX 3 | GPR RECORDS |

1.0 SUMMARY OF RESULTS

GPR and sonic/ultrasonic data were collected on floor slabs of the upper, middle, and lower levels of the Grade Crossings Railroad Station. Figure 2 shows the general location of the nondestructive testing lines of coverage, and Table 1 is a summary of the sonic/ultrasonic measurements.

Main-Floor Slab ("Waiting Room," "North Passage," and "South Passage")

GPR data indicated: 1- to 2-foot-wide beams at a 15-foot spacing trending east-west; north-south large reinforcing bar or steel webs with an approximate 5- to 6-foot spacing and an approximate 1 ½ to 2 inches of cover; and a smaller set of north-south reinforcing with an approximate 4- to 6-inch spacing and approximately 1 ½ to 2 inches from the bottom of the slab. Sonic/ultrasonic data indicated an average floor slab thickness of 7 ½ to 8 ½ inches with an average strength of 3,500 to 5,900 psi.

Upper-Level Slab ("North Passage")

GPR data indicated: reinforcing in the east-west direction to consist of bars with 2- to 2.5-foot spacing near the middle of the slab and a bar in the north-south direction near the middle of the floor. Since the passage is only 12 feet wide, it is assumed that there is some kind of support structure under the walls. Sonic/ultrasonic data indicated an average floor slab thickness of 6 +/- inches with an average strength of approximately 4,100 psi.

Middle Level, near the West Entrance and Stairs

GPR data indicated 1- to 2-foot-wide beams at the north and south extents of the doors and stairs running in an east-west direction. In the area between the beams and the doors/stairs there are east-west large reinforcing bar or steel webs at a 5- to 6-foot spacing with approximately 1 ½ to 2 inches of cover, and small east-west reinforcing with an approximate spacing of 4 to 6 inches and 1 ½ to 2 inches from the bottom of the slab. In the slabs north and south of these beams, GPR showed bars in the north-south direction at a 5- to 6-foot spacing with approximately 2 inches of cover; the reinforcing in the east-west direction, if any, may be a mesh. Sonic/ultrasonic data indicated an average floor slab thickness of 8 ½ inches with an average strength of approximately 4,400 psi.

Lower Level ("Men's Room") GPR data indicated that the reinforcing, if it exists, may be a mesh. Sonic/ultrasonic data indicated an average floor slab thickness of 7 +/- inches with an average strength of 3,400 to 4,300 psi.

2.0 INTRODUCTION AND PURPOSE

NDT Corporation conducted nondestructive ground penetrating radar (GPR) and sonic/ultrasonic testing of the floor slabs at selected locations at the Grade Crossings Railroad Station in Pawtucket-Central Falls, Rhode Island. Figure 1 is an area map showing the general location of the station. The survey was conducted on April 24, 2006. The objective of this investigation was to evaluate the reinforcing spacing and depth of cover and to determine the approximate thickness and general condition of the concrete floor slabs.

3.0 METHOD OF INVESTIGATION

3.1 Survey Control

Figure 2 is a plan of the station provided to NDT Corporation by URS. This plan shows the approximate locations of the GPR and sonic/ultrasonic lines of coverage. The nondestructive lines of coverage were located with measurements from walls, doors, and stairs.

3.2 Ground Penetrating Radar (GPR)

GPR data were acquired using a digital system coupled with a 900 MHz antenna. The GPR method used a pulsed electromagnetic signal that was sent to the point of transmission and reflected back by a target. The electromagnetic wave transmission and reflection are dependent on the dielectric constant and conductivity (electrical) properties of the material(s) being investigated. Since metal is highly conductive, reinforcing is distinguishable and acts as a strong reflector. A detailed discussion of the GPR survey method is included in Appendix 1.

3.3 Sonic/Ultrasonic Measurements

Stress-wave measurements in the sonic/ultrasonic frequency range were used to make direct measurements of the transmission velocity of both the compressional and shear waves, and to measure reflected phases of the compressional wave from the bottom of the concrete slab. The transmission velocity values determine the elastic deformational characteristics of the concrete, including Young's, shear, and bulk moduli, Poisson's Ratio, and calculated strength values. The reflected signals resonate at a frequency that is related to the thickness and compressional wave velocity of the concrete slab. The longitudinal velocity is measured directly, and the average thickness of the slab is determined from the measured resonant frequency. A more detailed discussion of the sonic/ultrasonic nondestructive testing method is included in Appendix 2.

Sonic/ultrasonic direct and resonant frequency measurements were obtained using a system designed and built by NDT Corporation specifically for testing concrete. This system uses a projectile impact energy source, a hand-held four-sensor array, and a portable computer to record and display the data. Sensors were spaced 2, 6, 18, and 30 inches from the energy impact point for all testing.

4.0 DISCUSSION OF RESULTS

GPR and sonic/ultrasonic data were collected on the floor slabs in several rooms at different levels at the Grade Crossings Railroad Station. On the main floor of the station, data were acquired in the "Waiting Room," "North Passage," and "South Passage." On the upper floor, data were acquired in the "North Passage." The middle-level slab was tested at the west entrance, and the lower-level slab was tested in the "Men's Room." Figure 2 is a plan map showing the lines of coverage and general locations of the rooms and passages.

GPR data were collected using a 900 MHz antenna with a survey wheel, along continuous lines of coverage, obtaining perpendicular lines west to east and south to north for each floor slab. GPR data were used to determine the reinforcing scheme of the floor slabs. GPR cannot determine exact bar sizes, but relative size can be inferred. GPR is sensitive to targets perpendicular to the direction of travel; therefore, GPR lines collected in the south-to-north direction would be used to determine the east-west trending reinforcing, while the lines collected in the west-to-east direction would be used to determine the north-south trending reinforcing. GPR can also be used to determine the cover and slab thickness, but due to the variability of moisture and debonding of tiles, these thicknesses were highly variable.

Sonic/ultrasonic data were collected at 2.5-foot intervals, along the same lines as the GPR. Sonic/ultrasonic data were used to measure the resonant frequency, compressional, and shear wave velocity of the concrete slab. The resonant frequency and compressional wave velocity data were used to determine the slab thickness. The compressional and shear wave velocity data were used to determine the in situ unconfined compressive strength. Debonded tiles adversely affected the sonic/ultrasonic measurements. Table 1 lists all of the individual sonic/ultrasonic values by location and distance along the survey line; locations with no velocity or frequency data are indicative of debonded tiles or possible deteriorated concrete.

Main-Floor (“South Passage,” “Waiting Room,” and “North Passage”)

GPR data indicated steel beams with 15- to 16-foot spacing, running from east to west. Reinforcing between the beams (the north-to-south direction) consisted of large reinforcing bar or steel webs with an approximate spacing of 5 to 6 feet and an approximate depth of cover of 1 ½ to 2 inches, and a bottom layer of “small” bars with a spacing of 4 to 6 inches and approximately 1 ½ to 2 inches above the bottom of the slab. The reinforcing at the bottom of the slab is believed to be a small diameter bar rather than wire mesh, because it was only detected on the east-west GPR lines of coverage.

Sonic/ultrasonic data indicated average compressional velocity in the range of 11,500 to 12,500 ft/sec with shear velocity in the range of 6,500 to 7,000 ft/sec. This velocity range equates to concrete with an average in situ unconfined compressional strength in the range of 3,500 to 5,900 psi. The resonant frequencies of the floor slab are in the range of 8 to 10 kHz, which equates to an average thickness of 7 ½ to 8 ½ inches. The floor slab in the “South Passage” may be 7 +/- inches thick, thinner than the other areas on the “Main Level.” This may be due, in part, to limited data because of debris and debonded tiles.

Upper Level (“North Passage”)

Reinforcing in the north-to-south direction consisted of a top layer of bars with an approximate spacing of 2 to 2.5 feet and an approximate depth of cover of 1 ½ to 2 inches. Only one bar or steel webs was detected in the east-to-west direction, approximately 5 to 6 feet from the south wall (near the center of the floor area).

Sonic/ultrasonic data indicated the average compressional velocity to be approximately 12,000 ft/sec with a shear velocity of approximately 6,700 ft/sec. These measured velocities equate to concrete with an average in situ unconfined compressional strength of approximately 4,100 +/- psi. The resonant frequency of the floor slab is approximately 11.5 kHz, which equates to a thickness of approximately 6+/- inches.

Middle Level (near "Front" West Door)

This area appeared to consist of three different slabs: north of stairs/doors, between the stairs and doors, and south of stairs/doors. In the areas north and south of the stairs/doors north-south large reinforcing bar or steel webs were located at a 5- to 6-foot spacing with approximately 1 ½ to 2 inches of cover; no individual east-west reinforcing bars were detected. This area may have wire mesh reinforcing, but it was not obvious. In the area between the stairs and doors, there is a steel beam at the north and south extents (in the east-to-west direction). Between these beams are two layers of reinforcing; a set of east-west large reinforcing bar or steel webs with an approximate 5- to 6-foot spacing and a bottom set of small reinforcing (also east-west) bars with a 4- to 6-inch spacing approximately 7 +/- inches from the top of the tiles. No individual north-south reinforcing bars were detected in the area between the beams. This area may have wire mesh reinforcing, but it was not obvious.

Sonic/ultrasonic data indicated the average compressional velocity to be approximately 12,000 ft/sec with a shear velocity of approximately 7,000 ft/sec. These velocity values equate to an average in situ unconfined compressional strength of approximately 4,400 +/- psi. The average resonant frequency of the floor slab is approximately 8.5 kHz, which equates to a thickness of approximately 8 1/2 inches.

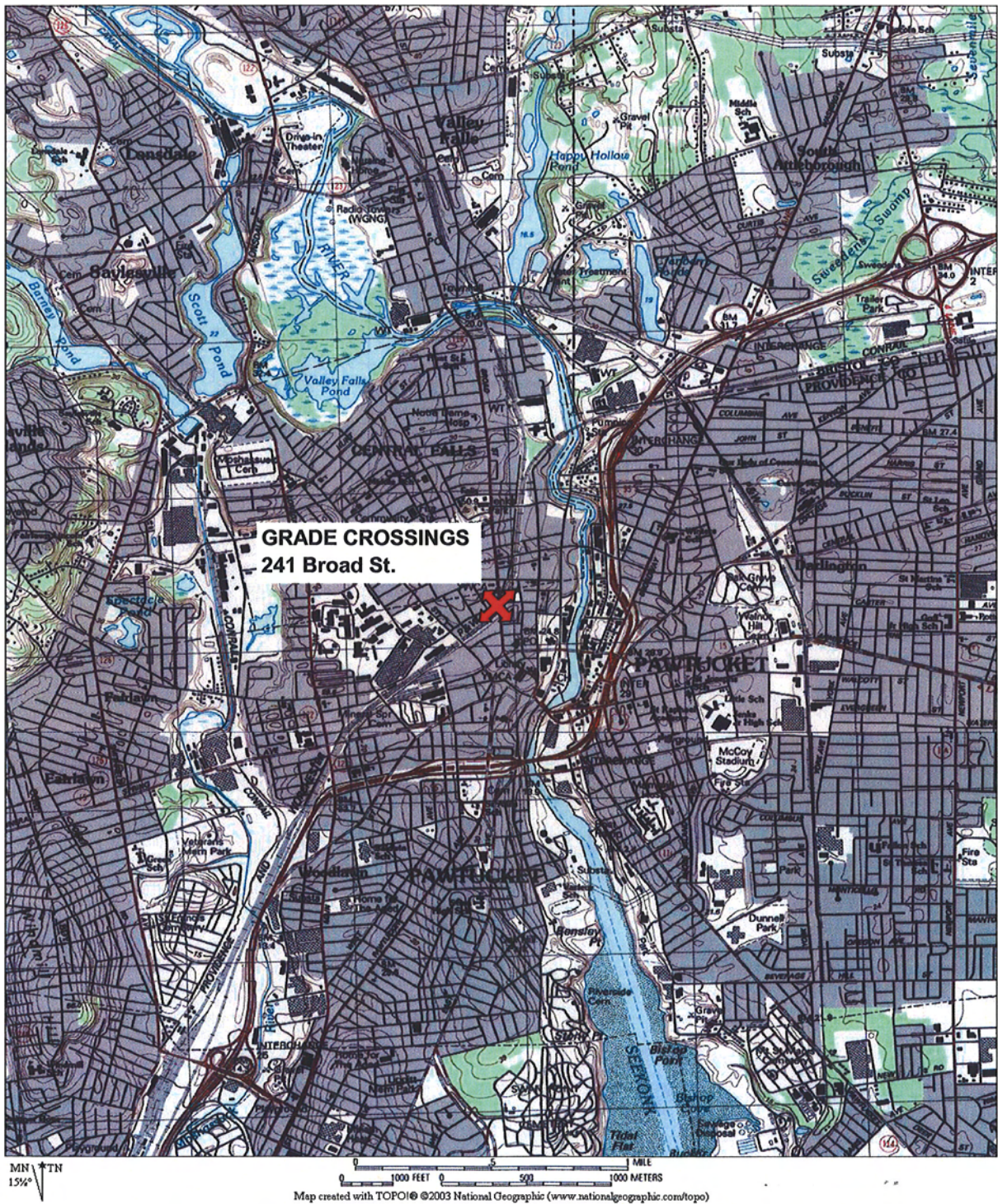
Lower Level ("Men's Room")

GPR data indicated that this slab is most likely not reinforced or there may be wire mesh.

Sonic/ultrasonic data indicated the average compressional velocity to be approximately 11,500 ft/sec with a shear velocity of approximately 6,400 ft/sec. These velocity values equate to an average in situ unconfined compressional strength of approximately 3 to 4,300 psi. The average resonant frequency of the floor slab is approximately 9.8 kHz, which equates to a thickness of approximately 7 +/- inches.

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FIGURES

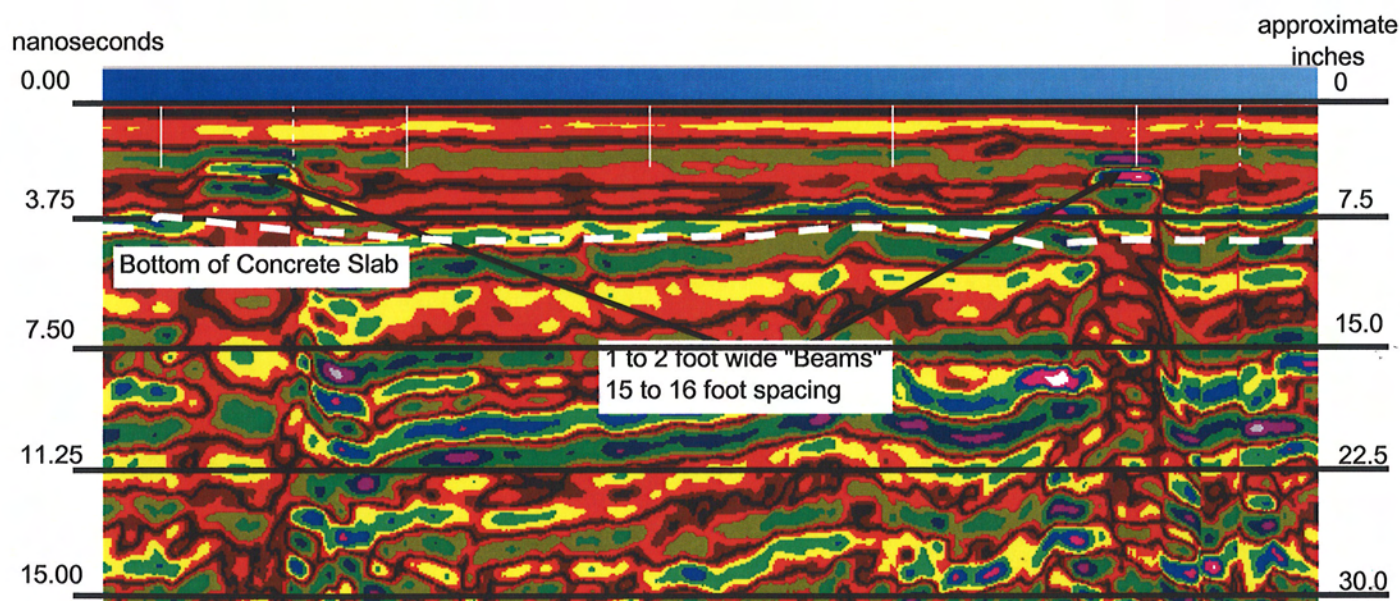
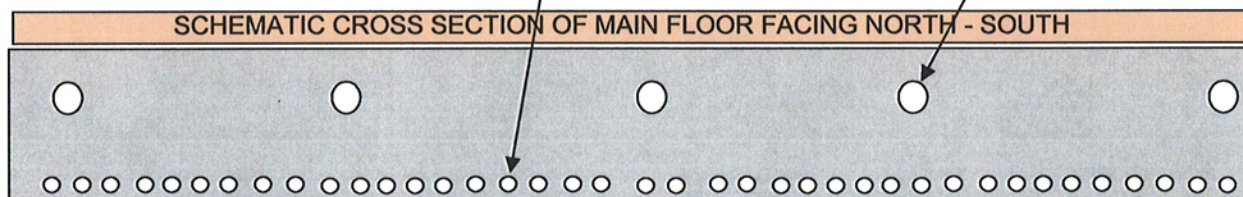
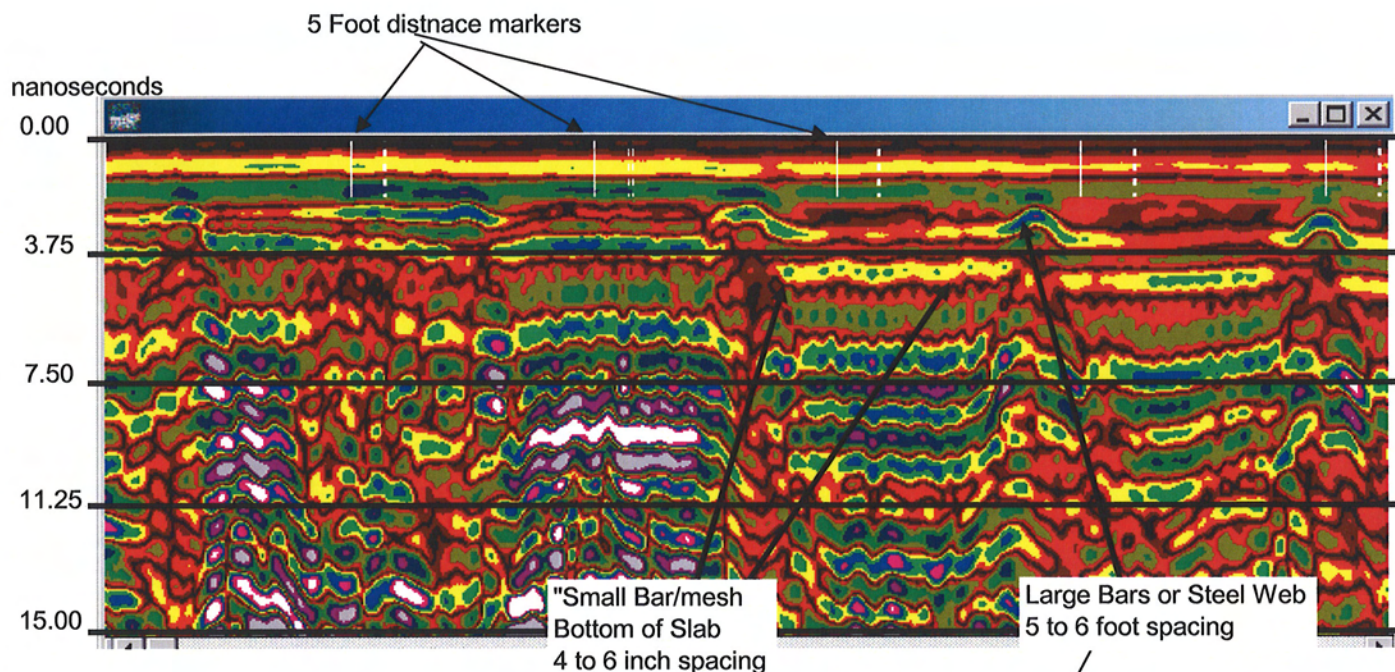


NONDESTRUCTIVE TESTING
 GRADE CROSSINGS RAILROAD STATION
 PAWTUCKET-CENTRAL FALLS
 RHODE ISLAND
 prepared for
 URS CORPORATION
 by
 NDT CORPORATION

AREA OF INVESTIGATION

May-06

Figure 1



NONDESTRUCTIVE TESTING
GRADE CROSSINGS RAILROAD STATION
PAWTUCKET-CENTRAL FALLS
RHODE ISLAND
prepared for
URS CORPORATION
by
NDT CORPORATION

Typical GPR Records
Small Bars/mesh,
Large Bars, and Beams

May-06

Figure 3

TABLES

Sonic/Ultrasonic Data

Main Floor South to North over Track 1

Begin near South Wall

| Shot | Section | Station (feet) | Compressional Velocity *1000 (ft/sec) | Shear Velocity *1000 (ft/sec) | Frequency kHz | | Strength PSI | Thickness (inches) | Comments |
|---------|---------|-------------------|---|-------------------------------------|------------------|--|-----------------|-----------------------|---------------|
| 1 | sp | 0 | 12,080 | 7,290 | | | 5,100 | | debonded tile |
| 2 | sp | 1 | 11,850 | 7,200 | 10.1 | | 4,800 | 7.2 | |
| 3 | sp | 5 | 12,200 | 7,330 | 12.5 | | 5,300 | 5.9 | |
| 4 | sp | 7.5 | | | | | | | debonded tile |
| 5 | sp | 10 | | | | | | | debonded tile |
| 6 | sp | 12.5 | | | | | | | debonded tile |
| 7 | wr | 15 | 11,260 | 6,630 | | | 3,600 | | debonded tile |
| 8 | wr | 17.5 | 11,010 | 6,600 | 9.0 | | 3,500 | 8.1 | |
| 9 | wr | 20 | 11,790 | 6,410 | 9.0 | | 3,500 | 8.1 | |
| 10 | wr | 22.5 | 11,570 | 6,170 | 8.3 | | 3,000 | 8.8 | |
| 11 | wr | 25 | 12,500 | 6,510 | | | 3,800 | | debonded tile |
| 12 | wr | 27.5 | 12,890 | 6,410 | | | 3,700 | | debonded tile |
| 13 | wr | 30 | 12,500 | 6,130 | | | 3,100 | | debonded tile |
| 14 | wr | 32.5 | 12,380 | | 8.6 | | | 8.5 | debonded tile |
| 15 | wr | 35 | 12,200 | 5,230 | 7.8 | | 1,800 | 9.3 | |
| 16 | wr | 37.5 | 12,200 | 5,270 | 11.8 | | 1,800 | 6.2 | |
| 17 | wr | 40 | 11,790 | 6,300 | 6.0 | | 3,300 | 12.2 | |
| 18 | wr | 42.5 | 11,960 | 7,440 | 8.6 | | 5,300 | 8.5 | |
| 19 | wr | 45 | 11,960 | 6,670 | | | 4,000 | | debonded tile |
| 20 | wr | 47.5 | 11,570 | 7,490 | 9.5 | | 5,000 | 7.7 | |
| 21 | wr | 50 | 11,960 | 6,740 | 8.5 | | 4,100 | 8.6 | |
| 22 | wr | 52.5 | 14,880 | 7,740 | | | 7,700 | | debonded tile |
| 23 | wr | 55 | 11,850 | 7,370 | | | 5,100 | | debonded tile |
| 24 | wr | 57.5 | 12,080 | 6,200 | | | 3,200 | | debonded tile |
| 25 | wr | 60 | 12,760 | 7,530 | | | 6,000 | | debonded tile |
| 26 | wr | 62.5 | 11,360 | 6,740 | 8.3 | | 3,800 | 8.8 | |
| 27 | wr | 65 | 11,360 | 7,330 | | | 4,700 | | debonded tile |
| 28 | wr | 67.5 | 11,360 | 7,060 | 8.6 | | 4,300 | 8.5 | |
| 29 | wr | 70 | 10,640 | 6,080 | 8.6 | | 2,700 | 8.5 | |
| 30 | wr | 72.5 | 11,850 | 6,700 | | | 4,000 | | debonded tile |
| 31 | wr | 75 | 13,020 | 7,490 | | | 6,100 | | debonded tile |
| 32 | l | 77.5 | | | | | | | debonded tile |
| 33 | l | 80 | 12,440 | 6,270 | | | 3,400 | | debonded tile |
| 34 | l | 82.5 | 12,500 | 7,840 | 9.2 | | 6,500 | 8.0 | |
| 35 | l | 85 | 12,500 | 7,840 | 8.6 | | 6,500 | 8.5 | |
| 36 | l | 87.5 | 12,500 | 7,990 | 9.0 | | 6,700 | 8.1 | |
| 37 | l | 90 | | | 9.2 | | | 8.0 | debonded tile |
| 38 | l | 92.5 | | | 9.2 | | | 8.0 | debonded tile |
| 39 | np | 95 | 12,500 | 7,990 | | | 6,700 | | debonded tile |
| 40 | np | 97.5 | 12,500 | 7,990 | 10.1 | | 6,700 | 7.2 | |
| 41 | np | 100 | 14,120 | 7,790 | 10.1 | | 7,500 | 7.2 | |
| Average | | | | | | | 4,600 | 8.2 | |

Sonic/Ultrasonic Data

Main Floor South to North over Track 3

Begin near South Wall

| Shot | Section | Station (feet) | Compressional Velocity *1000 (ft/sec) | Shear Velocity *1000 (ft/sec) | Frequency kHz | | Strength PSI | Thickness (inches) | Comments |
|---------|---------|-------------------|---|-------------------------------------|------------------|--|-----------------|-----------------------|---------------|
| 1 | sp | 0 | 12,500 | 6,480 | | | 3,800 | | debonded tile |
| 2 | sp | 2.5 | | | | | | | debonded tile |
| 3 | sp | 5 | | | 10.3 | | | 6.9 | debonded tile |
| 4 | sp | 7.5 | 14,970 | 8,960 | | | 11,900 | | debonded tile |
| 5 | sp | 10 | | | | | | | debonded tile |
| 6 | swr | 12.5 | | | | | | | debonded tile |
| 7 | wr | 15 | 11,850 | 6,930 | | | 4,400 | | debonded tile |
| 8 | wr | 17.5 | 11,630 | 6,650 | 8.8 | | 3,800 | 8.1 | |
| 9 | wr | 20 | 13,160 | 7,420 | 9.3 | | 6,000 | 7.6 | |
| 10 | wr | 22.5 | 12,500 | 7,060 | 7.8 | | 4,900 | 9.1 | |
| 11 | wr | 25 | 10,780 | 6,100 | | | 2,700 | | debonded tile |
| 12 | wr | 27.5 | 10,870 | 6,510 | | | 3,300 | | debonded tile |
| 13 | wr | 30 | 11,310 | 6,670 | 7.4 | | 3,700 | 9.6 | |
| 14 | wr | 32.5 | 11,850 | 5,970 | 9.5 | | 2,800 | 7.5 | |
| 15 | wr | 35 | 11,850 | 7,120 | 11.1 | | 4,700 | 6.4 | |
| 16 | wr | 37.5 | 8,170 | 3,070 | | | | | debonded tile |
| 17 | wr | 40 | 9,770 | 6,270 | | | 2,500 | | debonded tile |
| 18 | wr | 42.5 | 7,510 | 3,830 | | | | | debonded tile |
| 19 | wr | 45 | 13,090 | 7,720 | | | 6,700 | | debonded tile |
| 20 | wr | 47.5 | 12,080 | 7,200 | 9.5 | | 5,000 | 7.5 | |
| 21 | wr | 50 | 11,470 | 6,280 | | | 3,200 | | debonded tile |
| 22 | wr | 52.5 | 10,960 | 6,760 | 9.2 | | 3,700 | 7.8 | |
| 23 | wr | 55 | 14,790 | 7,670 | 9.3 | | 7,400 | 7.6 | |
| 24 | wr | 57.5 | 14,200 | 6,250 | | | 3,600 | | debonded tile |
| 25 | wr | 60 | 14,040 | 7,530 | 11.1 | | 6,700 | 6.4 | |
| 26 | wr | 62.5 | 14,370 | 7,160 | 9.2 | | 5,800 | 7.8 | |
| 27 | wr | 65 | 10,960 | 6,540 | 12.5 | | 3,400 | 5.7 | |
| 28 | wr | 67.5 | 11,470 | 6,850 | 9.3 | | 4,100 | 7.6 | |
| 29 | wr | 70 | 12,080 | 6,850 | 9.7 | | 4,300 | 7.4 | |
| 30 | wr | 72.5 | 6,170 | 3,340 | | | | | debonded tile |
| 31 | wr | 75 | | | | | | | debonded tile |
| 32 | l | 77.5 | | | 12.5 | | | 5.7 | debonded tile |
| 33 | l | 80 | 11,570 | 6,510 | 11.8 | | 3,600 | 6.1 | |
| 34 | l | 82.5 | 11,960 | 5,530 | 10.3 | | 2,100 | 6.9 | |
| 35 | l | 85 | 11,850 | 6,890 | 10.3 | | 4,300 | 6.9 | |
| 36 | l | 87.5 | 12,500 | 6,390 | 10.3 | | 3,600 | 6.9 | |
| 37 | l | 90 | | | 10.3 | | | 6.9 | debonded tile |
| 38 | l | 92.5 | | | | | | | debonded tile |
| 39 | np | 95 | 12,080 | 7,510 | | | 5,500 | | debonded tile |
| 40 | np | 97.5 | 13,300 | 7,620 | 9.2 | | 6,600 | 7.8 | |
| 41 | np | 100 | 13,590 | 7,990 | 9.2 | | 7,700 | 7.8 | |
| 42 | np | 102.5 | 11,960 | 7,620 | 9.9 | | 5,600 | 7.2 | |
| 43 | np | 105 | 12,760 | 7,600 | | | 6,200 | | debonded tile |
| Average | | | | | | | 4,800 | 7.3 | |

Sonic/Ultrasonic Data

Main Floor West to East "Waiting Room"

Begin 5 feet East of West Wall

| Shot | Section | Station (feet) | Compressional Velocity *1000 (ft/sec) | Shear Velocity *1000 (ft/sec) | Frequency kHz | | Strength PSI | Thickness (inches) | Comments |
|---------|---------|-------------------|---|-------------------------------------|------------------|--|-----------------|-----------------------|---------------|
| 1 | wr | 5 | 12,250 | 6,510 | | | 3,800 | | debonded tile |
| 2 | wr | 7.5 | 10,820 | 6,430 | 8.5 | | 3,200 | 8.0 | |
| 3 | wr | 10 | 10,420 | 6,580 | 8.5 | | 3,200 | 8.0 | |
| 4 | wr | 12.5 | 10,500 | 6,100 | 8.6 | | 2,700 | 7.8 | |
| 5 | wr | 15 | 11,680 | 7,060 | | | 4,500 | | debonded tile |
| 6 | wr | 17.5 | 11,060 | 6,050 | | | 2,700 | | debonded tile |
| 7 | wr | 20 | 11,790 | 6,430 | 7.8 | | 3,500 | 8.6 | |
| 8 | wr | 22.5 | 11,520 | 6,580 | | | 3,700 | | debonded tile |
| 9 | wr | 25 | 11,570 | 6,070 | 7.8 | | 2,900 | 8.6 | |
| 10 | wr | 27.5 | 11,960 | 6,510 | | | 3,700 | | debonded tile |
| 11 | wr | 30 | 10,420 | 6,160 | 11.6 | | 2,700 | 5.9 | |
| 12 | wr | 32.5 | 10,730 | 6,130 | 11.4 | | 2,800 | 6.0 | |
| 13 | wr | 35 | 10,420 | 6,380 | | | 2,900 | | debonded tile |
| 14 | wr | 37.5 | 10,500 | 6,270 | | | 2,900 | | debonded tile |
| 15 | wr | 40 | 11,060 | 6,700 | | | 3,600 | | debonded tile |
| 16 | wr | 42.5 | 11,520 | 6,460 | | | 3,500 | | debonded tile |
| 17 | wr | 45 | 12,500 | 7,140 | | | 5,100 | | debonded tile |
| 18 | wr | 47.5 | 11,420 | 6,870 | | | 4,100 | | debonded tile |
| 19 | wr | 50 | 11,420 | 6,790 | 10.7 | | 4,000 | 6.3 | |
| 20 | wr | 52.5 | 10,960 | 7,200 | 9.2 | | 4,200 | 7.4 | |
| 21 | wr | 55 | 11,310 | 6,580 | | | 3,600 | | debonded tile |
| 22 | wr | 57.5 | 11,900 | 6,830 | 8.8 | | 4,200 | 7.7 | |
| 23 | wr | 60 | 11,900 | 6,740 | 9.2 | | 4,100 | 7.4 | |
| 24 | wr | 62.5 | 11,160 | 6,200 | 8.5 | | 3,000 | 8.0 | |
| 25 | wr | 65 | 11,160 | 6,160 | 7.8 | | 2,900 | 8.6 | |
| 26 | wr | 67.5 | 10,500 | 5,850 | 6.6 | | 2,400 | 10.3 | |
| 27 | wr | 70 | 10,730 | 6,460 | 8.0 | | 3,200 | 8.5 | |
| 28 | wr | 72.5 | | | | | | | debonded tile |
| 29 | wr | 75 | 11,900 | 7,180 | 10.7 | | 4,800 | 6.3 | |
| 30 | wr | 77.5 | 12,080 | 7,200 | 10.9 | | 5,000 | 6.2 | |
| 31 | wr | 80 | 11,960 | 6,790 | | | 4,200 | | debonded tile |
| 32 | wr | 82.5 | 12,200 | 6,580 | | | 3,900 | | debonded tile |
| 33 | wr | 85 | 12,500 | 6,270 | 7.5 | | 3,400 | 9.0 | |
| 34 | wr | 87.5 | 12,500 | 6,540 | 7.3 | | 3,900 | 9.3 | |
| 35 | wr | 90 | 10,250 | 5,640 | 8.5 | | 2,100 | 8.0 | |
| 36 | wr | 92.5 | 10,040 | 5,470 | | | 1,800 | | debonded tile |
| 37 | wr | 95 | | | | | | | debonded tile |
| Average | | | | | | | 3,500 | 7.8 | |

Sonic/Ultrasonic Data

Main Floor West to East "Waiting Room"

Begin 5 feet East of West Wall

| Shot | Section | Station (feet) | Compressional Velocity *1000 (ft/sec) | Shear Velocity *1000 (ft/sec) | Frequency kHz | | Strength PSI | Thickness (inches) | Comments |
|----------------|---------|-------------------|---|-------------------------------------|------------------|--|-----------------|-----------------------|---------------|
| 1 | wr | 5.0 | 13,090 | 7,290 | | | 5,700 | | debonded tile |
| 2 | wr | 7.5 | 12,950 | 6,830 | 8.0 | | 4,600 | 9.1 | |
| 3 | wr | 10.0 | 10,120 | | 8.5 | | | 8.6 | debonded tile |
| 4 | wr | 12.5 | 10,640 | 5,870 | 7.5 | | 2,400 | 9.6 | |
| 5 | wr | 15.0 | 12,080 | 6,200 | 8.5 | | 3,200 | 8.6 | |
| 6 | wr | 17.5 | 12,500 | 7,000 | 9.0 | | 4,800 | 8.1 | |
| 7 | wr | 20.0 | 12,500 | 6,940 | 10.1 | | 4,700 | 7.2 | |
| 8 | wr | 22.5 | 12,500 | 6,760 | | | 4,300 | | debonded tile |
| 9 | wr | 25.0 | 12,080 | 6,280 | | | 3,300 | | |
| 10 | wr | 27.5 | 11,470 | 6,930 | | | 4,200 | | debonded tile |
| 11 | wr | 30.0 | 11,060 | 6,430 | 9.3 | | 3,300 | 7.8 | |
| 12 | wr | 32.5 | 11,680 | 6,790 | 7.7 | | 4,100 | 9.4 | |
| 13 | wr | 35.0 | 11,520 | 7,060 | | | 4,400 | | |
| 14 | wr | 37.5 | 13,300 | 6,490 | 8.8 | | 4,000 | 8.2 | |
| 15 | wr | 40.0 | 12,890 | 7,180 | | | 5,300 | | debonded tile |
| 16 | wr | 42.5 | 11,900 | 6,790 | 9.0 | | 4,200 | 8.1 | |
| 17 | wr | 45.0 | 11,060 | 6,430 | 10.1 | | 3,300 | 7.2 | |
| 18 | wr | 47.5 | 10,040 | 4,890 | 9.7 | | 1,300 | 7.5 | debonded tile |
| 19 | wr | 50.0 | 11,900 | 4,980 | | | 1,500 | | debonded tile |
| 20 | wr | 52.5 | 13,440 | 5,080 | | | 1,700 | | debonded tile |
| 21 | wr | 55.0 | 14,370 | 5,330 | | | 2,000 | | debonded tile |
| 22 | wr | 57.5 | 13,970 | 5,730 | | | 2,600 | | debonded tile |
| 23 | wr | 60.0 | 12,500 | 7,100 | 9.9 | | 5,000 | 7.3 | |
| 24 | wr | 62.5 | 11,850 | 6,680 | | | 4,000 | | |
| 25 | wr | 65.0 | 11,960 | 6,630 | 8.8 | | 3,900 | 8.2 | |
| 26 | wr | 67.5 | 12,500 | 5,920 | 8.8 | | 2,800 | 8.2 | |
| 27 | wr | 70.0 | 11,310 | 6,760 | 9.2 | | 3,900 | 7.9 | |
| 28 | wr | 72.5 | 11,310 | 6,930 | 8.8 | | 4,100 | 8.2 | |
| 29 | wr | 75.0 | 11,360 | 6,390 | 8.3 | | 3,300 | 8.7 | |
| Average | | | | | | | 3,600 | 8.2 | |

Sonic/Ultrasonic Data

Main Floor West to East "South Passage"

Begin 15 feet East of West Wall

| Shot | Section | Station (feet) | Compressional Velocity *1000 (ft/sec) | Shear Velocity *1000 (ft/sec) | Frequency kHz | | Strength PSI | Thickness (inches) | Comments |
|---------|---------|----------------|---------------------------------------|-------------------------------|---------------|--|--------------|--------------------|---------------|
| 1 | sp | 15 | 9,030 | 5,330 | 11.6 | | 1,500 | 6.5 | debonded tile |
| 2 | sp | 17.5 | 11,520 | 6,250 | 11.4 | | 3,100 | 6.6 | |
| 3 | sp | 20 | | | 10.5 | | | 7.1 | debonded tile |
| 4 | sp | 22.5 | 10,370 | 6,000 | 12.3 | | 2,500 | 6.1 | |
| 5 | sp | 25 | | | 8.2 | | | 9.2 | debonded tile |
| 6 | sp | 27.5 | 13,660 | 7,550 | 10.5 | | 6,600 | 7.1 | |
| 7 | sp | 30 | 13,510 | 7,960 | 8.5 | | 7,600 | 8.8 | |
| 8 | sp | 32.5 | 13,020 | 7,650 | 9.2 | | 6,500 | 8.2 | |
| 9 | sp | 35 | 13,370 | 7,860 | 10.5 | | 7,200 | 7.1 | |
| 10 | sp | 37.5 | 13,660 | 7,810 | 10.5 | | 7,300 | 7.1 | |
| 11 | sp | 40 | 14,120 | 7,600 | | | 6,900 | | debonded tile |
| Average | | | | | | | 5,500 | 7.4 | |

Sonic/Ultrasonic Data

Main Floor West to East "North Passage"

Begin at West Wall

| Shot | Section | Station (feet) | Compressional Velocity *1000 (ft/sec) | Shear Velocity *1000 (ft/sec) | Frequency kHz | | Strength PSI | Thickness (inches) | Comments |
|---------|---------|----------------|---------------------------------------|-------------------------------|---------------|--|--------------|--------------------|---------------|
| 1 | np | 0 | 12,200 | 8,010 | | | 6,400 | | debonded tile |
| 2 | np | 2.5 | 12,500 | | 9.0 | | | 8.2 | debonded tile |
| 3 | np | 5 | 12,500 | 8,010 | 8.0 | | 6,700 | 9.2 | |
| 4 | np | 7.5 | 12,500 | 8,010 | 9.0 | | 6,700 | 8.2 | |
| 5 | np | 10 | 12,500 | 7,990 | 9.5 | | 6,700 | 7.7 | |
| 6 | np | 12.5 | 12,500 | 7,720 | 10.1 | | 6,200 | 7.3 | |
| 7 | np | 15 | | | 9.9 | | 8,300 | 7.5 | debonded tile |
| 8 | np | 17.5 | 12,500 | 8,010 | 9.3 | | 6,700 | 7.9 | |
| 9 | np | 20 | | | 9.9 | | | 7.5 | debonded tile |
| 10 | np | 22.5 | 11,850 | 7,440 | 8.6 | | 5,200 | 8.5 | |
| 11 | np | 25 | 12,500 | 7,580 | 9.0 | | 6,000 | 8.2 | |
| 12 | np | 27.5 | 10,590 | | 9.0 | | | 8.2 | debonded tile |
| 13 | np | 30 | 12,560 | 7,810 | 7.8 | | 6,500 | 9.4 | |
| 14 | np | 32.5 | 13,090 | 7,840 | 7.4 | | 7,000 | 10.0 | |
| 15 | np | 35 | 13,890 | 8,010 | 9.7 | | 8,000 | 7.6 | |
| 16 | np | 37.5 | 12,950 | 7,580 | 10.1 | | 6,300 | 7.3 | |
| 17 | np | 40 | 12,500 | 7,510 | | | 5,800 | | debonded tile |
| 18 | np | 42.5 | 12,500 | 7,440 | 9.7 | | 5,700 | 7.6 | |
| 19 | np | 45 | | | 10.5 | | | 7.0 | debonded tile |
| 20 | np | 47.5 | 12,200 | 7,310 | 9.9 | | 5,300 | 7.5 | |
| 21 | np | 50 | 10,870 | | 10.1 | | | 7.3 | |
| 22 | np | 52.5 | 13,160 | | 9.3 | | | 7.9 | |
| 23 | np | 55 | | | 9.5 | | | 7.7 | debonded tile |
| 24 | np | 57.5 | 10,460 | | 9.9 | | | 7.5 | |
| 25 | np | 60 | 11,630 | 6,530 | 9.0 | | 3,600 | 8.2 | |
| 26 | np | 62.5 | 12,140 | 7,990 | | | 6,300 | | debonded tile |
| 27 | np | 65 | 12,500 | 7,650 | | | 6,100 | | debonded tile |
| 28 | np | 67.5 | 12,500 | 6,330 | | | 3,500 | | debonded tile |
| 29 | np | 70 | 12,500 | 7,720 | | | 6,200 | | debonded tile |
| 30 | np | 72.5 | 11,850 | 5,920 | | | 2,700 | | debonded tile |
| 31 | np | 75 | 11,850 | 6,630 | | | 3,900 | | debonded tile |
| Average | | | | | | | 5,900 | 8.0 | |

Sonic/Ultrasonic Data

Upper Floor West to East "North Passage"

Begin at West Wall

| Shot | Section | Station (feet) | Compressional Velocity *1000 (ft/sec) | Shear Velocity *1000 (ft/sec) | Frequency kHz | | Strength PSI | Thickness (inches) | Comments |
|----------------|---------|-------------------|---|-------------------------------------|------------------|--|-----------------|-----------------------|---------------|
| 1 | upnp | 0 | 13,090 | | | | | | debonded tile |
| 2 | upnp | 2.5 | 13,090 | 6,190 | | | 3,300 | | debonded tile |
| 3 | upnp | 5 | 12,630 | 6,460 | | | 3,800 | | debonded tile |
| 4 | upnp | 7.5 | 12,500 | 6,440 | 13.8 | | 3,700 | 5.3 | |
| 5 | upnp | 10 | 12,500 | 6,460 | | | 3,700 | | debonded tile |
| 6 | upnp | 12.5 | 11,850 | 6,560 | 13.3 | | 3,700 | 5.5 | |
| 7 | upnp | 15 | 11,850 | 6,960 | 11.0 | | 4,400 | 6.6 | |
| 8 | upnp | 17.5 | 11,900 | 6,960 | 12.7 | | 4,500 | 5.7 | |
| 9 | upnp | 20 | 11,360 | 6,560 | 12.0 | | 3,600 | 6.0 | |
| 10 | upnp | 22.5 | 10,500 | 6,530 | 11.8 | | 3,200 | 6.2 | |
| 11 | upnp | 25 | 12,500 | 6,350 | 12.0 | | 3,500 | 6.0 | |
| 12 | upnp | 27.5 | 12,500 | 6,460 | 13.0 | | 3,700 | 5.6 | |
| 13 | upnp | 30 | 12,500 | 6,600 | 13.0 | | 4,000 | 5.6 | |
| 14 | upnp | 32.5 | 12,500 | 6,960 | 11.6 | | 4,700 | 6.3 | |
| 15 | upnp | 35 | 11,850 | 6,680 | 11.6 | | 4,000 | 6.3 | |
| 16 | upnp | 37.5 | 12,500 | 6,960 | 13.3 | | 4,700 | 5.5 | |
| 17 | upnp | 40 | 12,500 | 6,910 | 11.4 | | 4,600 | 6.4 | |
| 18 | upnp | 42.5 | 12,500 | 6,960 | 11.1 | | 4,700 | 6.5 | |
| 19 | upnp | 45 | 12,500 | 6,960 | | | 4,700 | | debonded tile |
| 20 | upnp | 47.5 | 12,500 | 6,960 | 10.5 | | 4,700 | 6.9 | |
| 21 | upnp | 50 | 10,920 | | 11.8 | | | 6.2 | debonded tile |
| 22 | upnp | 52.5 | 10,680 | 6,190 | 10.5 | | 2,800 | 6.9 | |
| 23 | upnp | 55 | | | | | | | debonded tile |
| 24 | upnp | 57.5 | 12,500 | 6,960 | 12.0 | | 4,700 | 6.0 | |
| 25 | upnp | 60 | 12,020 | 6,680 | | | 4,000 | | debonded tile |
| 26 | upnp | 62.5 | 12,890 | 6,810 | | | 4,500 | | debonded tile |
| 27 | upnp | 65 | 12,890 | 6,220 | | | 3,400 | | debonded tile |
| 28 | upnp | 67.5 | 13,370 | 6,220 | | | 3,400 | | debonded tile |
| 29 | upnp | 70 | 8,470 | 4,570 | | | | | debonded tile |
| 30 | upnp | 72.5 | | | 10.4 | | | 7.0 | debonded tile |
| 31 | upnp | 75 | 11,420 | | 9.7 | | | 7.5 | debonded tile |
| 32 | upnp | 77.5 | 12,020 | 7,000 | | | 4,600 | | debonded tile |
| 33 | upnp | 80 | 12,320 | 7,330 | 9.8 | | 5,400 | 7.4 | |
| 34 | upnp | 82.5 | | | 9.9 | | | 7.3 | debonded tile |
| 35 | upnp | 85 | | | 9.9 | | | 7.3 | debonded tile |
| 36 | upnp | 87.5 | | | 12.5 | | | 5.8 | debonded tile |
| 37 | upnp | 90 | 12,020 | 6,960 | 11.6 | | 4,500 | 6.3 | |
| 38 | upnp | 92.5 | | | | | | | debonded tile |
| 39 | upnp | 95 | 11,630 | 7,100 | | | 4,500 | | debonded tile |
| 40 | upnp | 97.5 | 12,140 | 7,230 | 10.7 | | 5,100 | 6.8 | |
| Average | | | | | | | 4,100 | 6.3 | |

Sonic/Ultrasonic Data

Middle Floor near Front Entrance

Begin near North Wall

| Shot | Section | Station (feet) | Compressional Velocity *1000 (ft/sec) | Shear Velocity *1000 (ft/sec) | Frequency kHz | | Strength PSI | Thickness (inches) | Comments |
|---------|---------|-------------------|---|-------------------------------------|------------------|--|-----------------|-----------------------|---------------|
| 1 | front | 0.0 | 13890 | 6870 | | | 4900 | | debonded tile |
| 2 | front | 2.5 | 12950 | 7160 | 9.2 | | 5300 | 7.8 | |
| 3 | front | 5.0 | 12500 | 7000 | 9.2 | | 4800 | 7.8 | |
| 4 | front | 7.5 | 11900 | 7160 | 9.2 | | 4800 | 7.8 | |
| 5 | front | 10.0 | 12320 | 7290 | | | 5300 | | debonded tile |
| 6 | front | 12.5 | 11740 | 6940 | 9.9 | | 4300 | 7.2 | |
| 7 | front | 15.0 | 11790 | 7290 | | | 4900 | | debonded tile |
| 8 | front | 17.5 | 11960 | 7370 | 8.0 | | 5200 | 8.9 | |
| 9 | front | 20.0 | 10460 | | 7.8 | | | 9.1 | debonded tile |
| 10 | front | 22.5 | 11850 | 6940 | 8.2 | | 4400 | 8.8 | |
| 11 | front | 25.0 | 10080 | 5970 | | | 2400 | | debonded tile |
| 12 | front | 27.5 | 10780 | 6190 | 7.1 | | 2900 | 10.0 | |
| 13 | front | 30.0 | 11680 | 6630 | 7.1 | | 3800 | 10.0 | |
| 14 | front | 32.5 | 11790 | 7270 | 9.2 | | 4900 | 7.8 | |
| 15 | front | 35.0 | | | 9.7 | | | 7.4 | debonded tile |
| 16 | front | 37.5 | 11850 | 5830 | | | 2600 | | debonded tile |
| 17 | front | 40.0 | 12080 | 7330 | 8.6 | | 5200 | 8.3 | |
| 18 | front | 42.5 | 11960 | 6940 | 8.2 | | 4500 | 8.8 | |
| Average | | | | | | | 4,400 | 8.4 | |

Sonic/Ultrasonic Data

Lower Floor "Mens Room"

Begin near South Wall

| Shot | Section | Station (feet) | Compressional Velocity *1000 (ft/sec) | Shear Velocity *1000 (ft/sec) | Frequency kHz | | Strength PSI | Thickness (inches) | Comments |
|---------|---------|----------------|---------------------------------------|-------------------------------|---------------|--|--------------|--------------------|---------------|
| 1 | mensn-s | 95.0 | 11,210 | 6,130 | 8.2 | | 2,900 | 8.2 | |
| 2 | mensn-s | 97.5 | 11,680 | 6,930 | 9.3 | | 4,300 | 7.2 | |
| 3 | mensn-s | 100.0 | 11,960 | 6,790 | | | 4,200 | | debonded tile |
| 4 | mensn-s | 102.5 | 10,640 | 5,800 | 10.5 | | 2,300 | 6.4 | |
| 5 | mensn-s | 105.0 | 12,500 | 7,460 | 9.9 | | 5,700 | 6.8 | |
| 6 | mensn-s | 107.5 | 8,900 | | 10.3 | | | 6.5 | debonded tile |
| 7 | mensn-s | 110.0 | 11,110 | 5,970 | | | 2,600 | | debonded tile |
| 8 | mensn-s | 112.5 | 11,630 | 6,440 | 9.7 | | 3,500 | 6.9 | |
| 9 | mensn-s | 115.0 | 9,430 | 5,620 | | | 1,800 | | debonded tile |
| 10 | mensn-s | 117.5 | 10,680 | 5,190 | 10.5 | | 1,600 | 6.4 | |
| 11 | mensn-s | 120.0 | 12,320 | 7,100 | 10.3 | | 4,900 | 6.5 | |
| 12 | mensn-s | 122.5 | 10,820 | 6,580 | 9.9 | | 3,400 | 6.8 | |
| 13 | mensn-s | 125.0 | 13,300 | 6,070 | 7.4 | | 3,100 | 9.1 | |
| 14 | mensn-s | 127.5 | | | 9.2 | | | 7.3 | debonded tile |
| Average | | | | | | | 3,400 | 7.1 | |

Sonic/Ultrasonic Data

Lower Floor "Mens Room"

Begin near West Wall

| Shot | Section | Station (feet) | Compressional Velocity *1000 (ft/sec) | Shear Velocity *1000 (ft/sec) | Frequency kHz | | Strength PSI | Thickness (inches) | Comments |
|---------|---------|----------------|---------------------------------------|-------------------------------|---------------|--|--------------|--------------------|---------------|
| 1 | mensw-e | 0.0 | 12,500 | 7,000 | 10.3 | | 4,800 | 6.8 | |
| 2 | mensw-e | 2.5 | 12,500 | 7,000 | 10.3 | | 4,800 | 6.8 | |
| 3 | mensw-e | 5.0 | 12,500 | 7,000 | 10.3 | | 4,800 | 6.8 | |
| 4 | mensw-e | 7.5 | 12,500 | 7,000 | 10.3 | | 4,800 | 6.8 | |
| 5 | mensw-e | 10.0 | 12,500 | 7,000 | 10.3 | | 4,800 | 6.8 | |
| 6 | mensw-e | 12.5 | 11,420 | 5,630 | | | 2,200 | | debonded tile |
| 7 | mensw-e | 15.0 | 11,790 | 6,580 | | | 3,800 | | debonded tile |
| 8 | mensw-e | 17.5 | 8,620 | 3,060 | | | | | debonded tile |
| 9 | mensw-e | 20.0 | 11,960 | 6,960 | 10.3 | | 4,500 | 6.8 | |
| 10 | mensw-e | 22.5 | 11,060 | 6,790 | 9.5 | | 3,800 | 7.4 | |
| Average | | | | | | | 4,300 | 6.9 | |

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APPENDIX 1

GROUND PENETRATING RADAR

APPENDIX: GROUND PENETRATING RADAR

Ground Penetrating Radar (GPR) is an electrical geophysical method for evaluating subsurface conditions by transmitting high frequency electromagnetic waves into the ground and detecting the energy reflected back to the surface. Electromagnetic signals are transmitted from the antenna (transmitter and receiver) at ground surface and reflected back to the antenna from interfaces with differing electrical (dielectric constant and conductivity) properties. The greater the contrast in the electrical properties between two materials, the more energy that is reflected to the surface and the more defined results are.

GPR reflections typically occur at subsurface discontinuities such as:

- Buried metal objects (utilities, tanks, reinforcing)
- Open and water filled voids
- Water table
- Soil stratification
- Seepage paths
- Bedrock fractures

The depth of penetration of GPR is site specific, limited by the attenuation of the electromagnetic energy. Signal attenuation is controlled by four different mechanisms:

- Scattering: energy losses due to scattering occur when signals are dispersed in random directions, away from the receiving antenna, by closely spaced rebar or large irregular shaped objects, such as boulders or tree stumps.
- High conductivity layers: the greater the conductivity values of materials at a site, the more signal attenuation or less penetration. (Mineral content, high moisture content, water table, metal plates, etc.)
- Water/Moisture Content: water molecules polarize in the presence of the applied electromagnetic field. Electromagnetic energy is lost to the radar system when it is converted to kinetic and thermal energy.
- Clays, (Ion content): ions along clay surfaces polarize in the presence of the applied electromagnetic field. Electromagnetic energy is lost to the radar when it is converted to kinetic and thermal energy.

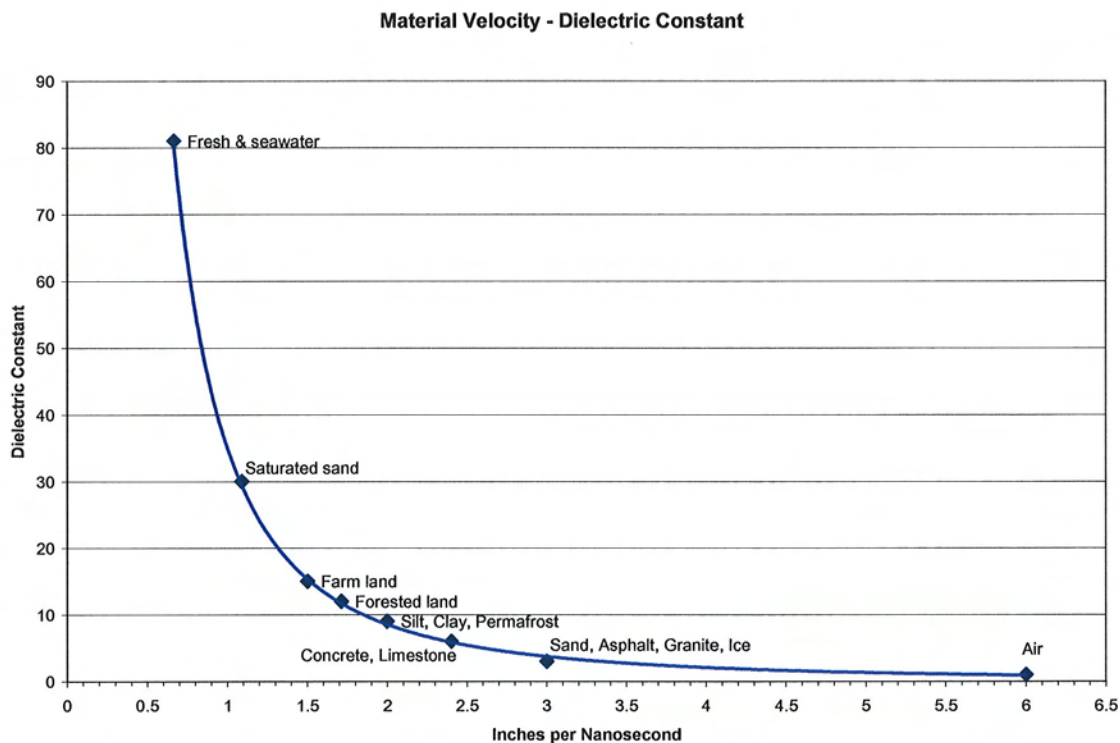
An onsite calibration should be conducted so that the velocity for the materials and the depth of penetration can be determined. Sites can be electrically variable so it may be necessary to conduct multiple onsite calibrations.

Signal penetration is also dependent on the frequency of the antenna. High frequency antennas have shallow penetration and high resolution. A 1500 MHz high frequency antenna has an approximate depth of penetration of 1.5 feet and is able to identify wire mesh. Low frequency antennas have lower resolution and deeper depth of investigation. A 400 MHz antenna is capable of penetrating 10 to 15 feet in dry soils.

Ground Penetrating Radar (GPR) can be used to locate underground pipes, buried drums, foundations, voids in rock and concrete, soil settlement, determine stratigraphy, depth to

water table, buried artifacts, filled excavations, and locate voids/settlement behind walls and under floor slabs, etc. GPR is also a good tool for evaluating concrete structures such as bridges, walls, beams, ceilings, etc where the GPR can locate rebar and conduits, quantify rebar spacing, cover variability over reinforcing, and concrete thickness.

Laterally GPR can cover large areas relatively quickly. Using a grid pattern of survey lines it is very effective for mapping the lateral extents of subsurface features as well as calculating the depth to the features of interest. Depth of investigation can be estimated using material dielectric constants and the diagram shown below. Accurate depth calculations require an onsite calibration, to determine the electrical properties (speed of the signal) of the materials at the site. Depth calibrations typically consist of collecting GPR data over a metal target with a known depth. Known utilities, and buried metal plates are good targets for calibrations. GPR surveys can be very effective when coupled with other geophysical surveys and/or ground truth methods to verify, correlate and extrapolate GPR results. GPR surveys are a fast and cost effective method to collect data over large or obstructed sites, and isolate anomalies and areas where borings or other methods can be focused for the best interest of a project.



GPR systems consist of: Control unit (pulse transmitter, digital recorder, data storage, monitor); and an antenna(s).

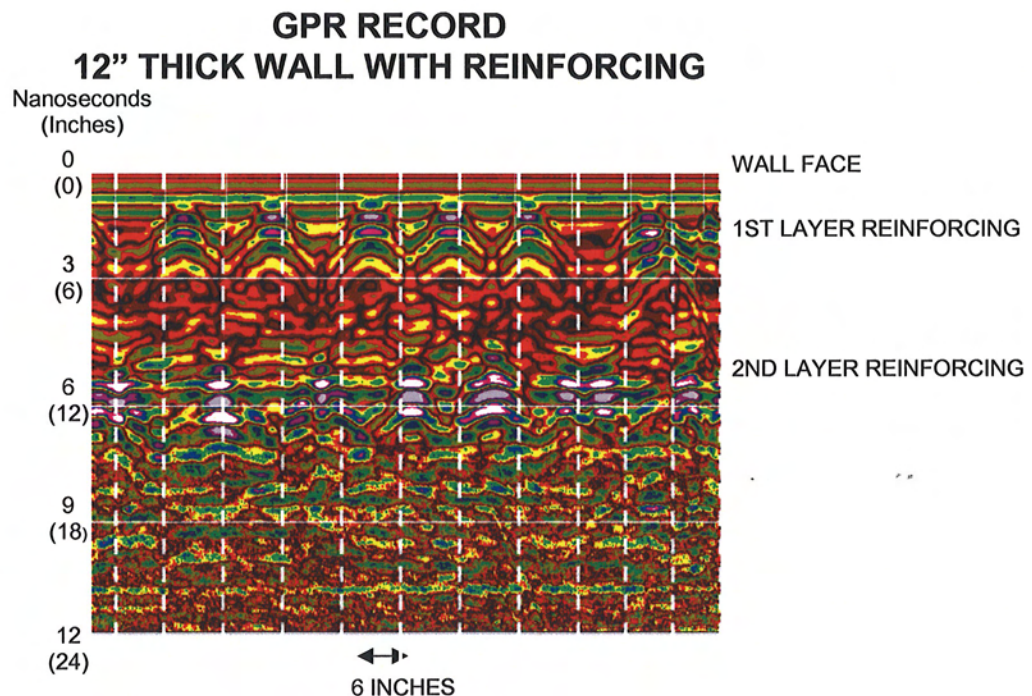
The GPR control unit is a computer which controls data acquisition parameters, such as sampling rate, range, gain control, filtering, etc. The Control Unit also visually displays the data, digitally archives the data, and allows for play back of the data.

Coaxial cable connects the control unit to the antenna. The antenna(s) are sealed and shielded in fiberglass housing for the transmitter and receiver. Selection of the antenna is dictated by the requirements of the survey. For high resolution, near-surface data, a high frequency antenna is used; for deeper penetration investigation, a lower frequency antenna is used. Typically the 80 to 300 MHz antennas are used for geologic surveys; 300 to 900MHz are used for utility, near surface voiding settlement, foundation, etc surveys while the 900 to 1500 MHz is used for concrete assessment.

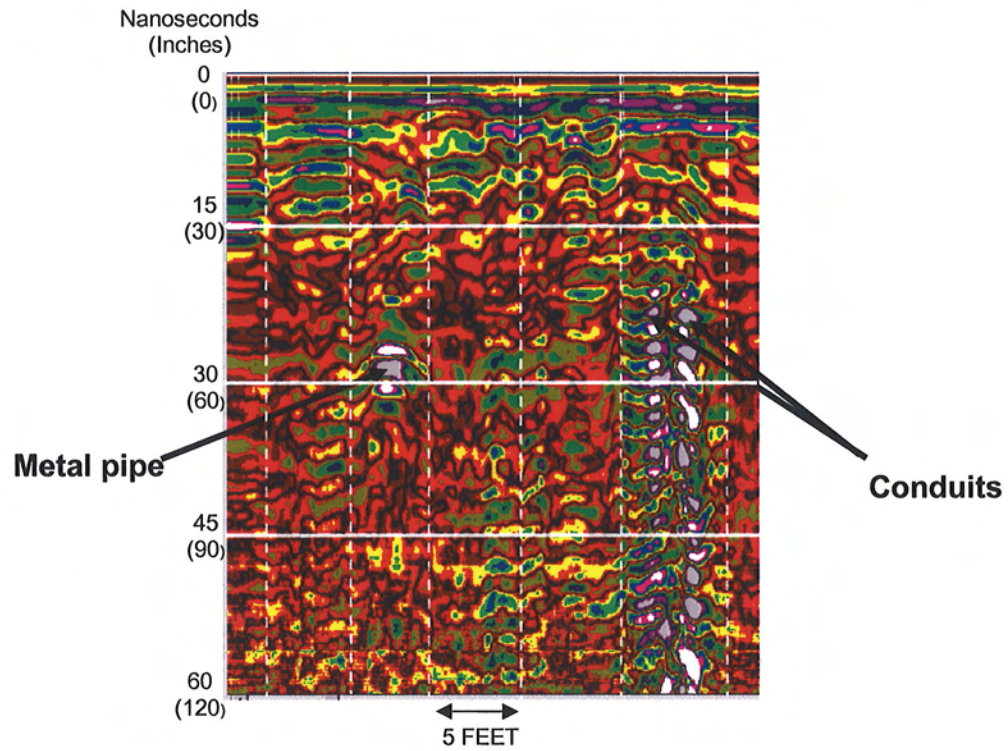
ACQUISITION AND INTERPRETATION:

Radar signals propagate from the antenna in a 15 to 45 degree cone, thus the slower the speed of the antenna the greater the horizontal resolution. Radar data are typically acquired at a slow walking speed. Data are printed and digitally saved. Station markers and any field notes are written right on the printed copy and the digitally saved data can be used to reprint or to use with post processing software.

Interpretation of GPR data is subjective, even among experienced interpreters. GPR results should be verified with borings or test pits. The strength of a reflected signal and/or the continuity of the reflector across the record may be indicative of a stratigraphic contact. Point targets, such as reinforcing, buried utilities, boulders, create a distinctive parabolic feature on GPR records. Annotated GPR records of reinforcing and buried metal utilities are shown below. Positive identification of the source of a point targets is subjective, as the GPR signature of a pipe is similar to that of a large boulder. Computer processing is available though it is somewhat costly and in most cases is not necessary, except for presentation purposes.



UNDER GROUND UTILITY LOCATION/MAPPING



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APPENDIX 2

SONIC/ULTRASONIC MEASUREMENTS

APPENDIX

SONIC/ULTRASONIC NONDESTRUCTIVE TESTING OF CONCRETE

The sonic/ultrasonic measurements made to determine the characteristics of concrete (or rock) are generated by a relatively low energy source as a single discrete wide band impulse with a pulsed transducer, projectile, mechanical hammer, etc. Practical problems and the condition of the concrete surface largely determine the source(s) to be used. A rough concrete surface that has deposits of organic materials or mineral deposits generally requires a more powerful energy source whereas a relatively new or wet concrete may be inspected by the use of a pulsed transducer or other higher frequency source. In general high frequency sources that may work well in the laboratory may be unusable for field conditions. High frequency sources have the advantage of high resolution but the disadvantage of low penetration. While metals can be tested in the megahertz range, such signals in concrete will not have measurable signals for more than an inch in thickness. The energy source should be sufficient to maximize the resolution, have sufficient penetration to examine the concrete being tested and enough energy to excite the fundamental frequencies being sought.

The transmitted energy is in the form of three principal wave types: compressional (contraction/expansion, spring-like particle motion), shear (traction-sliding motion), and surface waves (combination of motions). Each boundary that has density and or velocity contrast will reflect and/or refract these waves. Compressional and shear wave velocity values are determined by the Young's, shear and bulk moduli values as well as the density and Poisson's Ratio. In turn the velocity can be used to determine the moduli values and Poisson's Ratio given that the density is known or can be assumed. The moduli values measured are the dynamic moduli values at low strain. In general, the difference between the dynamic values and the static values is almost entirely controlled by the crack densities of the concrete. Using the modulus values, a reasonable estimate of the unconfined compressive strength can be determined. The strength is largely dependent on the crack density of the concrete and for static tests, the orientation of the cracks. For static testing, cracks perpendicular to the axis of the core and perpendicular to the directed stress will produce a strength (static) that is not greatly different from uncracked concrete. The applied stress closes or compresses the cracks. Cracks that are near 45° to the direction of stress will result in lowest static strength. The approximate orientation of the cracks can be determined with dynamic measurements of the velocity values in different directions.

NDT Corporation makes several determinations from one energy impact. The velocity is measured directly from the energy point of impact to a linear array(s) of sensors on the surface. The array length is usually in excess of the thickness of the concrete being tested. In addition to the velocity measurements, reflections are measured individually or determined from a frequency analysis of the time domain recordings. Each reflecting surface (change of density and/or velocity) produces a multi-path reflection in the layer it bounds. A generated wave will travel to a delamination surface and reflect back to the surface of the concrete where it is reflected back to the delamination, resulting in multi-reflections that are apparent in the frequency domain. These reverberations (echoes) are particularly diagnostic of delaminations and thickness of the concrete. They will readily distinguish the presence of local delaminations, cracked or decomposed inclusions by the particular frequency band generated at the mechanical discontinuity. If a delamination is

severe or large in area, the reflected signals are strong resulting in a low frequency, high amplitude, and long duration “ringing” signal or a drum head effect that is usually quite distinguishable. This is the basis of the ‘chain drag’ using the human ear as the sensor to recognize frequency differences. The ear however is limited in its perception and will only distinguish within the hearing range.

DIRECT AND REFRACTED ENERGY

One of the advantages of the sonic/ultrasonic method is its ability to “look through” overlying materials coatings, particularly decomposed “softer layers” when the array(s) is configured properly. This is done using refracted waves associated with the different layer velocities or by careful examination of the resonant frequencies associated with such layering.

The diagram below shows the wave path for refracted energy generated for a softer (1) lower velocity layer over a harder (2) higher velocity layer. For example asphalt (1) over good concrete (2). The wave is bent (similar to the appearance of a stick in water) and travels along the boundary between the lower velocity layer and the higher velocity layer and radiates back to the surface. The higher velocity of the good concrete allows the refracted wave to overtake the direct wave in layer 1 at some distance designated as $D_{1|2}$. To the left of this point the lower velocity of layer 1 will be measured and beyond it the velocity of the deeper layer 2 is measured.

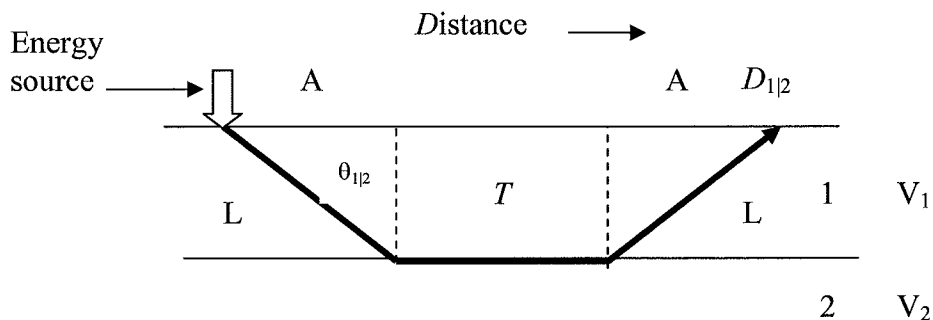


Figure A1

The time for the direct path is D/V_1 , the refracted path time is $2L/V_1 + (D_{1|2} - 2A)/V_2$. The array of sensors is placed in the distance direction and the time elapsed (travel time) from the time of energy impact to the sensor distance is measured. The velocity is determined from this time-distance measurement(s). The angle θ is the angle between the perpendicular to the layer and the incident wave that is critically refracted. The sine of this angle is the velocity of the first layer divided by that of the second layer (Snell's Law). The distance shown $D_{1|2}$ is the point on the surface where the refracted time arrival equals that of the direct wave (the refracted wave travels at a higher velocity than the direct wave).

$$\frac{D}{T} = \frac{D - 2 \tan \Theta}{V_2} + \frac{2T}{V_1 \cos \Theta}$$

The thickness is expressed as:

$$T = \frac{D_{1/2}}{2} \sqrt{\frac{V_2 - V_1}{V_2 + V_1}}$$

D is the distance and T is the thickness. Since the times as well as the distances are measured, then V_1 and V_2 are determined. If a plot of distance versus time is made then the resulting graph will look like Figure A2.

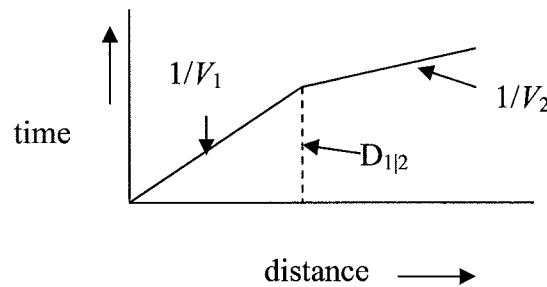


Figure A2

If the concrete has no overlay then the concrete velocity is simply D/T .

The resonant frequencies are determined by the thickness and velocity of the material. Since the velocity is measured as above, then the thickness can be determined directly.

The resonance of a simple beam is given by:

$$f = \frac{nV}{2L} \quad (\text{fixed} - \text{fixed}, \quad \text{free} - \text{free}) \quad \text{where } n = 1, 2, 3, \dots$$

$$f = \frac{nV}{4L} \quad (\text{open} - \text{fixed}), \quad \text{where } n = 1, 3, 5, 7, \dots$$

Since the frequency and velocity are measured, the thickness is determined. This thickness can be the thickness of the concrete floor, deck slabs, or column being measured or it can be the thickness of concrete overlying a delamination.

While the refracted wave is dependent only on a contrast in velocity, a reflection can take place where there is a change in velocity or density or both. The impedance (RF reflection coefficient) which causes a wave to be reflected is given by:

$$RF = \frac{\rho_2 V_2 - \rho_1 V_1}{\rho_2 V_2 + \rho_1 V_1}$$

Where ρ is the density and V is the velocity of the material. The impedance determines the strength of the reflection. The contrast between an air filled void at the back of or within the concrete is significant; the velocity in air is 1,000ft/sec. and the velocity of good concrete is 13,000ft/sec. The density differences are of course very large between the concrete and air. A similar difference exists for a water filled void where the velocity in water is 5,000ft/sec. and concrete is nearly a factor of 2.5 denser. Voiding behind a liner or under a slab is usually well distinguished by a distinct “ringing” resonant frequency, referred to above as a drum head effect..

MODULI VALUES AND STRENGTH

The moduli values as stated above are determined from the velocity values using an assumed or measured density. The density is usually the best known or best estimated value for the concrete, its variance generally does not affect the calculations significantly.

The relationships for Young's modulus versus the compressional velocity are shown in Figure A4; shear modulus versus the shear velocity Figure A5; Poisson's Ratio versus the compressional and shear wave velocities Figure A6; and finally a relationship between the velocity values (compressional and shear) and the unconfined compressive strength of concrete, Figure A7.

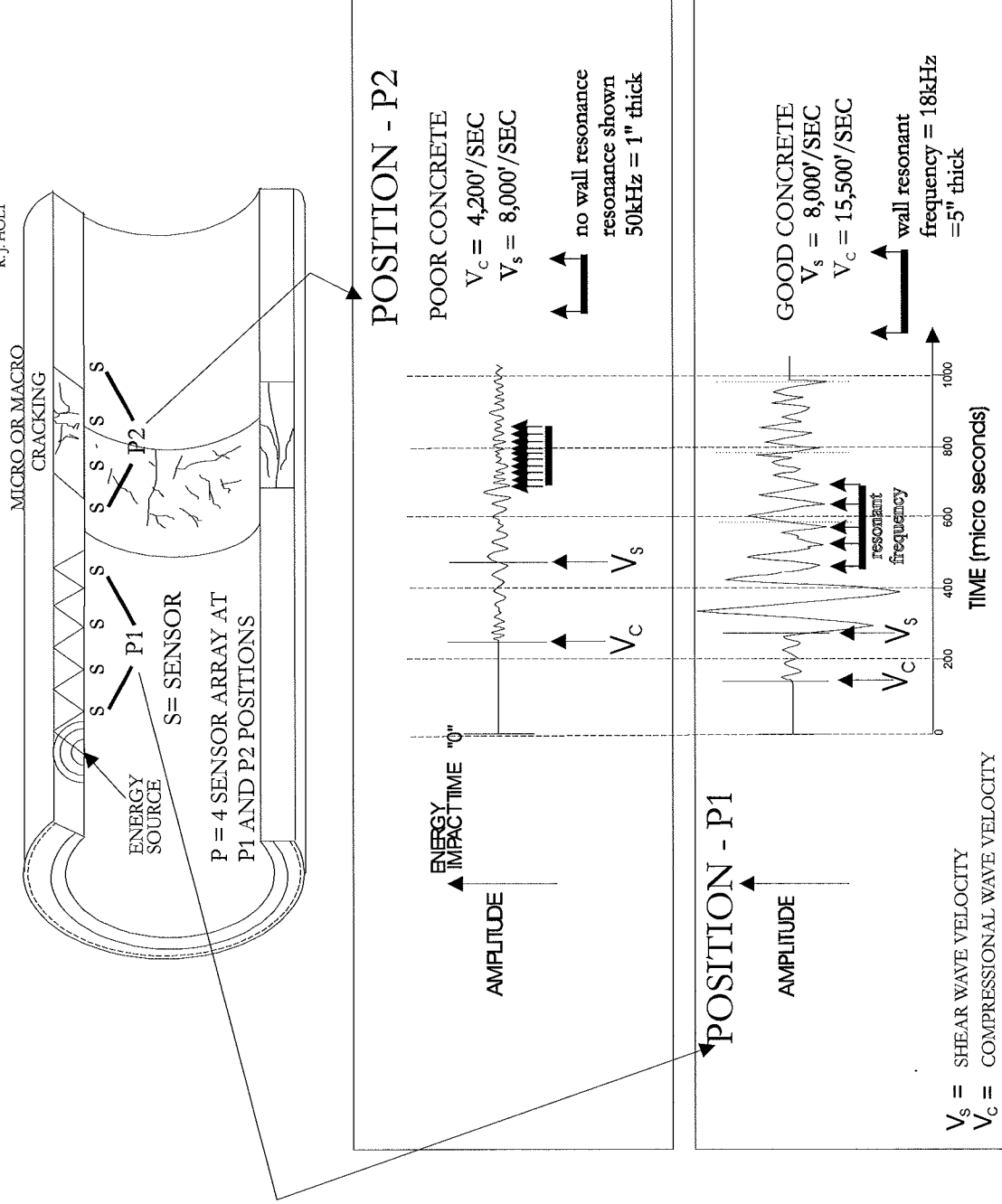
Figure A3 is illustrative of a tunnel liner or pipe investigation where there has been circumferential damage, perhaps at a construction joint or an outside zone of weakness (rock shear or fault, soil washout etc.) that has affected the integrity of the liner. The damage need not be visible; there can be a 20% reduction in the strength of the concrete from micro-cracking that is not visible to the naked eye. The process of deterioration of most concrete starts at the micro level and with continued stress the micro cracks coalesce into macro cracks and finally to spalling. The ability to measure at the micro level well in advance of future needed repairs provides a management tool for establishing priorities for repair, projected budgets, and asset valuation

SONIC/ULTRASONIC TUNNEL & PIPE LINE TESTING

Circumferential (face to back) Cracking

NDT ENGINEERING, INC.

R.J. HOLT



SONIC/ULTRASONIC TIME AMPLITUDE RECORDS
FOR FOURTH SENSOR - POOR AND GOOD CONCRETE

FIGURE A3

YOUNG'S MODULUS - SHEAR VELOCITY - POISSON'S RATIO

NDT ENGINEERING, INC.
R. J. HOLT

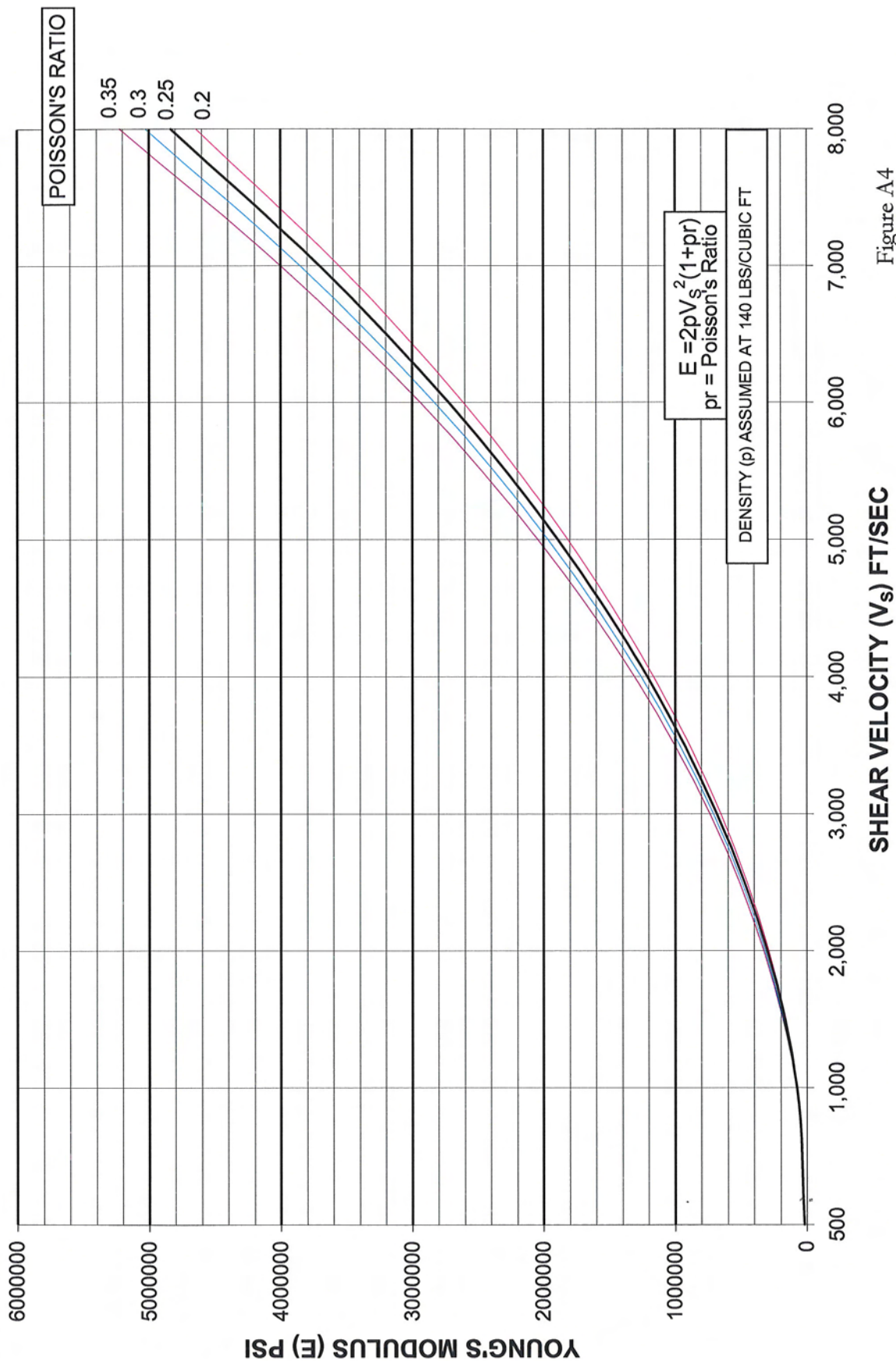


Figure A4

SHEAR MODULUS - SHEAR VELOCITY

NDT ENGINEERING, INC.
R.J.HOLT

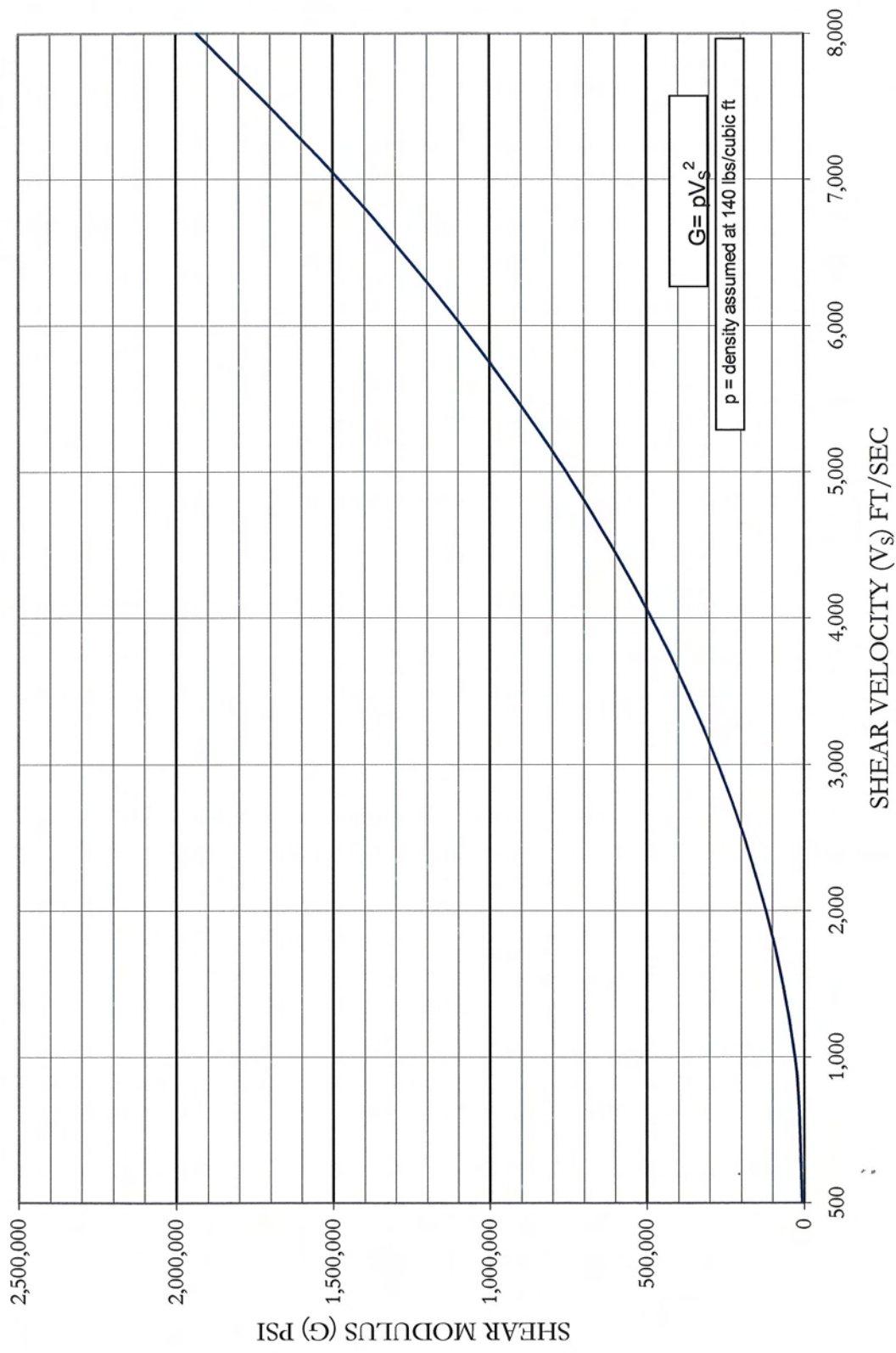


Figure A5

COMPRESSIONAL VELOCITY - SHEAR VELOCITY - POISSON'S RATIO

NDT ENGINEERING, INC.
R J HOLT

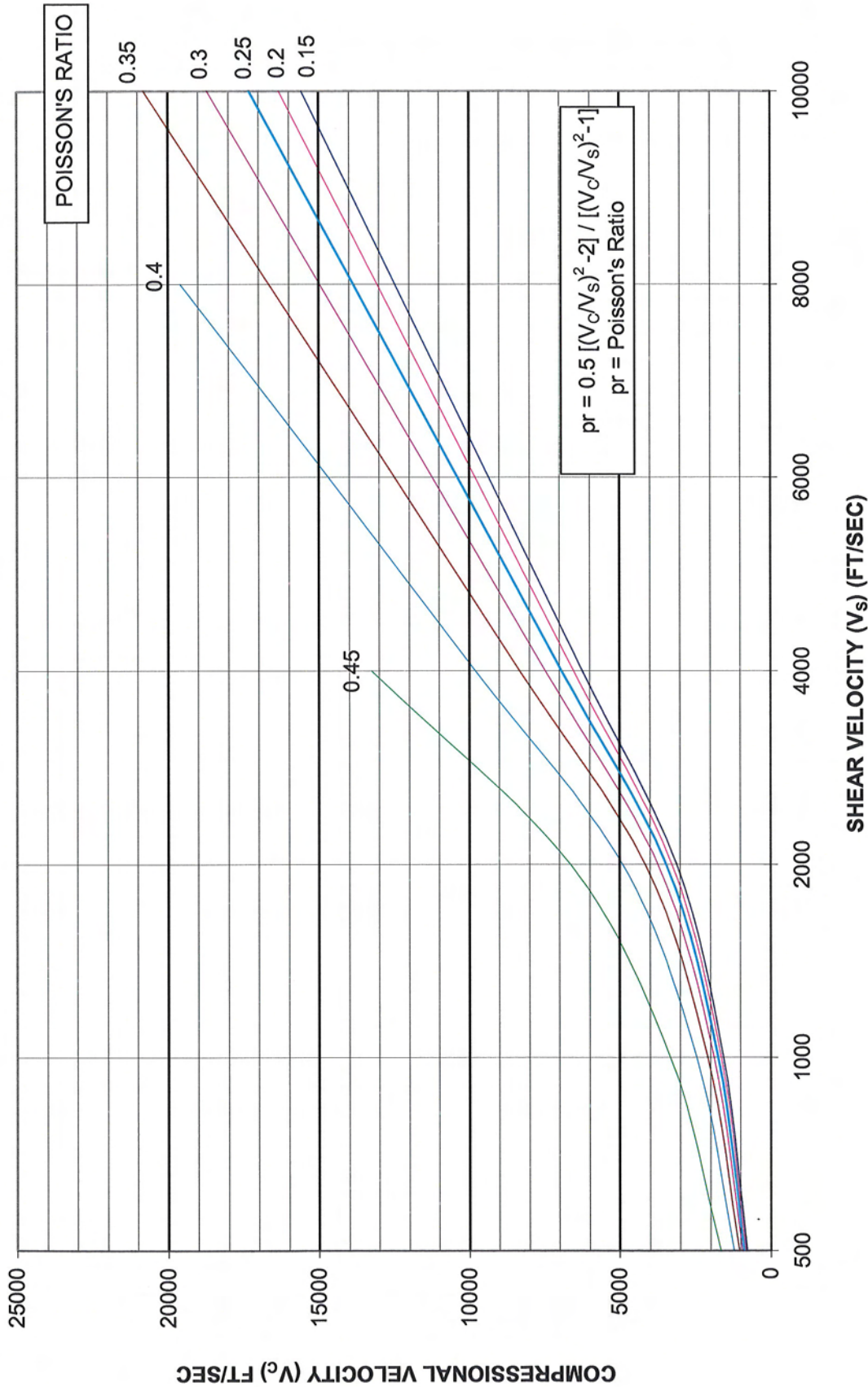
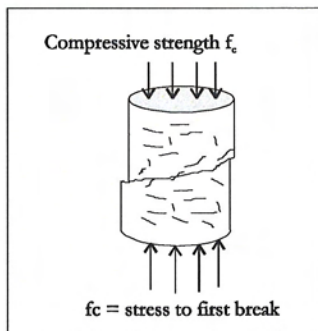
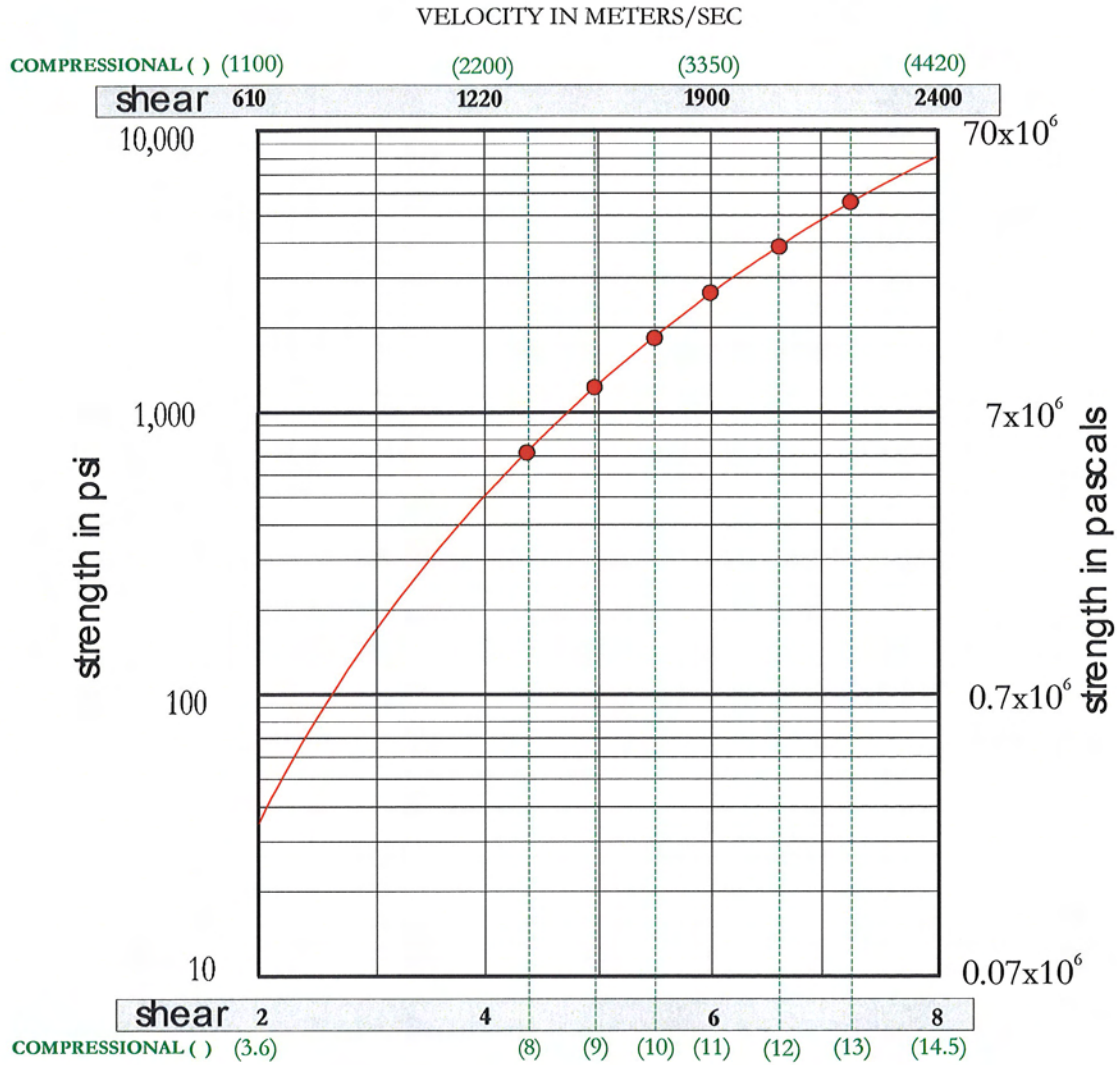


Figure A6

strength of concrete versus velocity

r. j. holt



VELOCITY IN FEET/SEC (X 1,000)

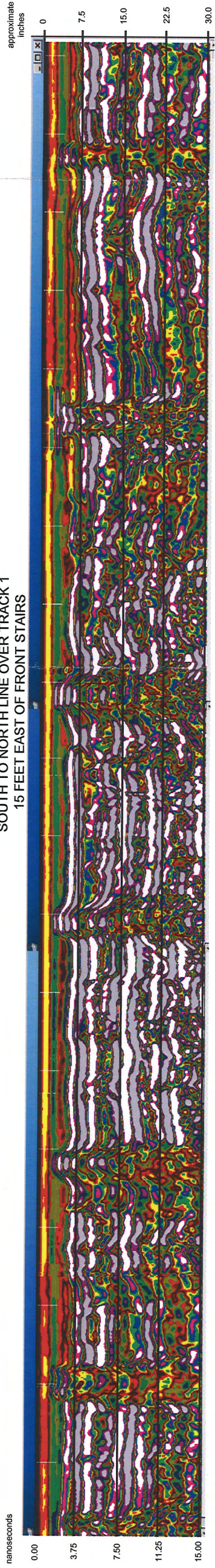
CURVE FOR RATIO: $V_{\text{SHEAR}} / V_{\text{COMPRESSIONAL}} = 0.55$
EQUALS POISSON'S RATIO OF 0.28

FIGURE A7
NDT ENGINEERING, INC.

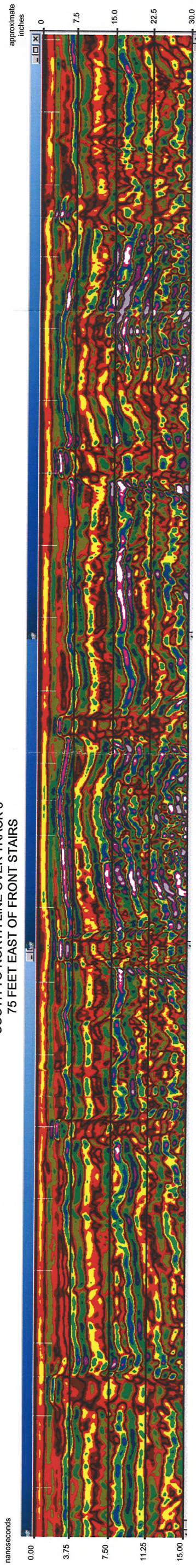
APPENDIX 3

GPR RECORDS

FILE 121 MAIN LEVEL
SOUTH TO NORTH LINE OVER TRACK 1
15 FEET EAST OF FRONT STAIRS

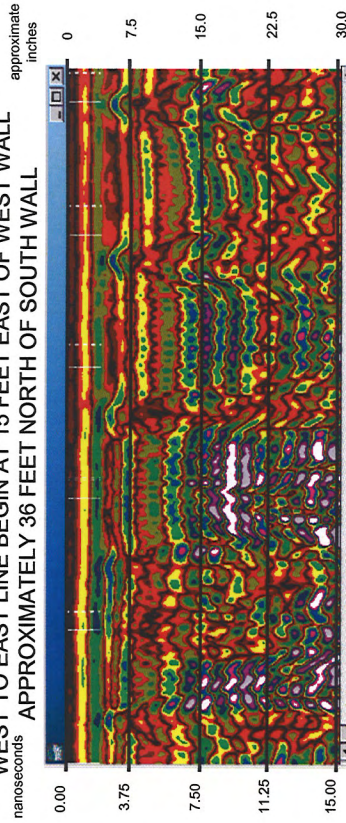


FILE 127 MAIN LEVEL
SOUTH TO NORTH LINE OVER TRACK 3
75 FEET EAST OF FRONT STAIRS



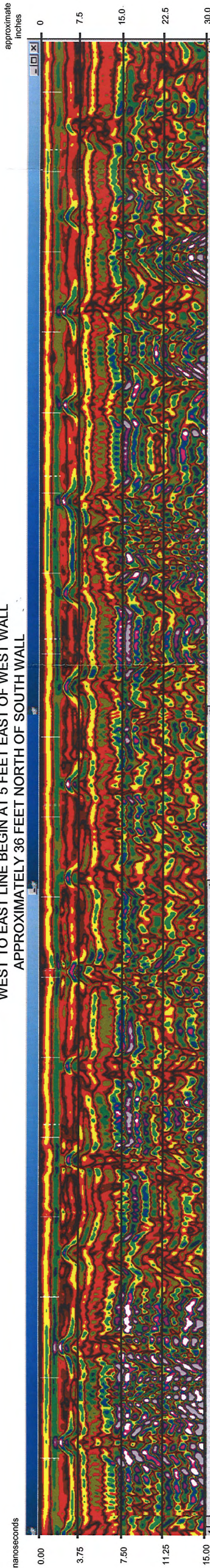
FILE 129 "SOUTH PASSAGE" MAIN LEVEL

WEST TO EAST LINE BEGIN AT 15 FEET EAST OF WEST WALL
APPROXIMATELY 36 FEET NORTH OF SOUTH WALL



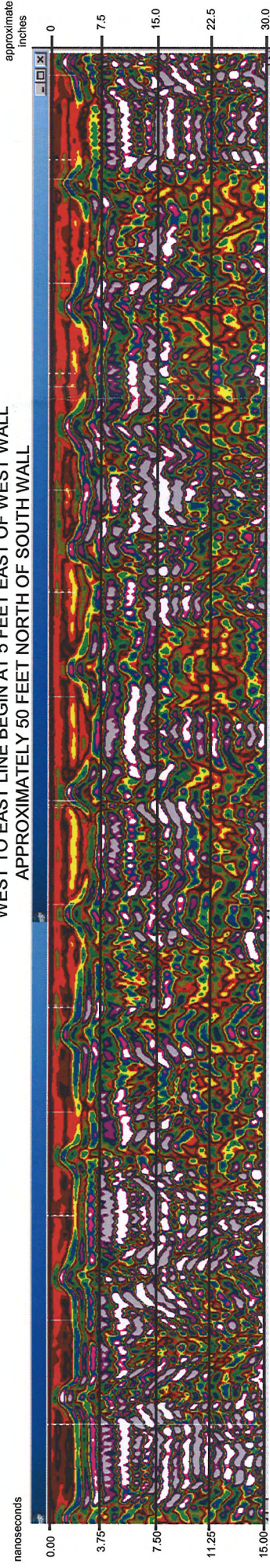
FILE 128 "WAITING ROOM" MAIN LEVEL

WEST TO EAST LINE BEGIN AT 5 FEET EAST OF WEST WALL
APPROXIMATELY 36 FEET NORTH OF SOUTH WALL



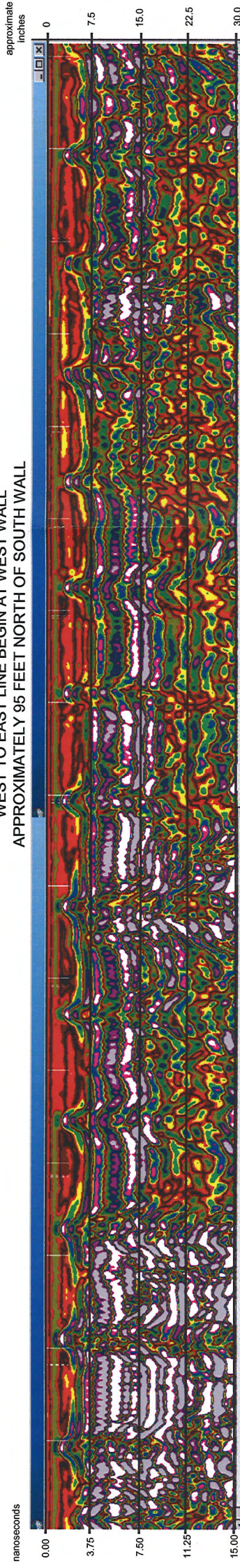
FILE 130 "WAITING ROOM" MAIN LEVEL

WEST TO EAST LINE BEGIN AT 5 FEET EAST OF WEST WALL
APPROXIMATELY 50 FEET NORTH OF SOUTH WALL

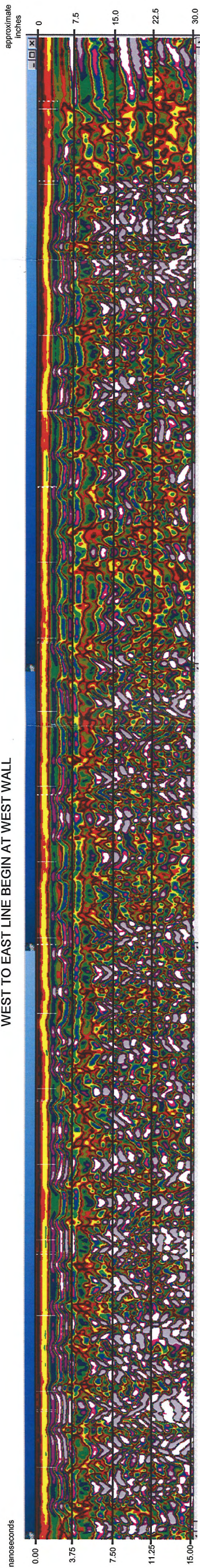


FILE 130 "NORTH PASSAGE" MAIN LEVEL

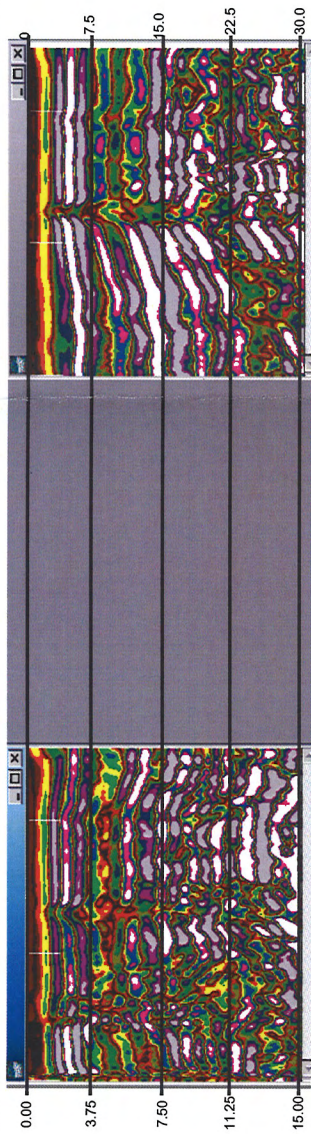
WEST TO EAST LINE BEGIN AT WEST WALL
APPROXIMATELY 95 FEET NORTH OF SOUTH WALL



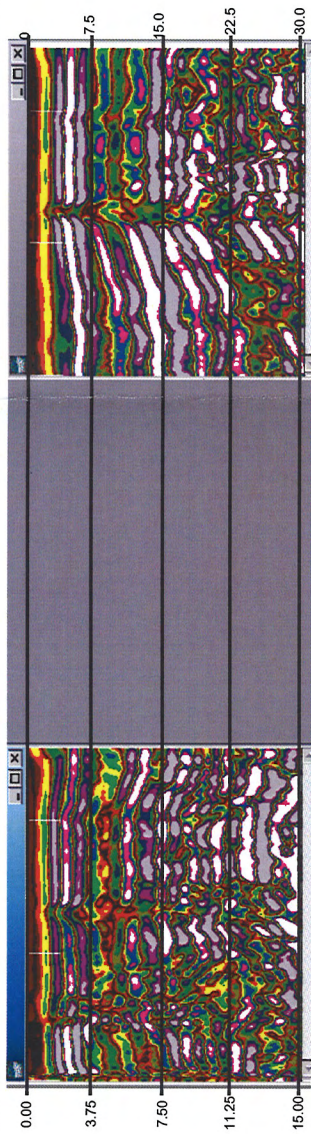
FILE 131 "NORTH PASSAGE UPSTAIRS"
WEST TO EAST LINE BEGIN AT WEST WALL



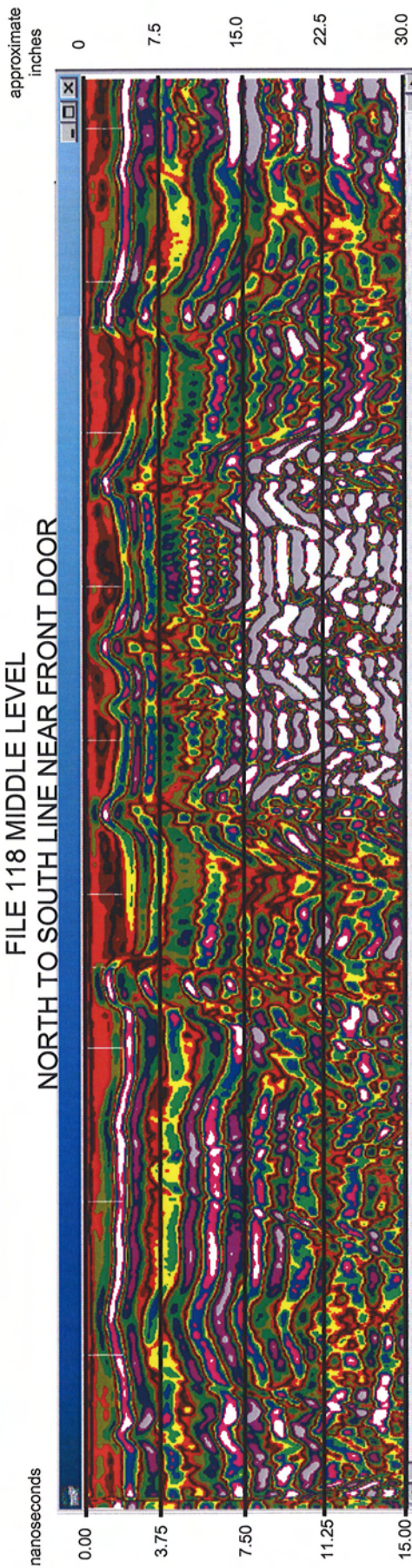
FILE 133 "NORTH PASSAGE UPSTAIRS"
SOUTH TO NORTH LINE BEGIN AT SOUTH WALL
APPROXIMATELY 30 FEET EAST OF WEST WALL



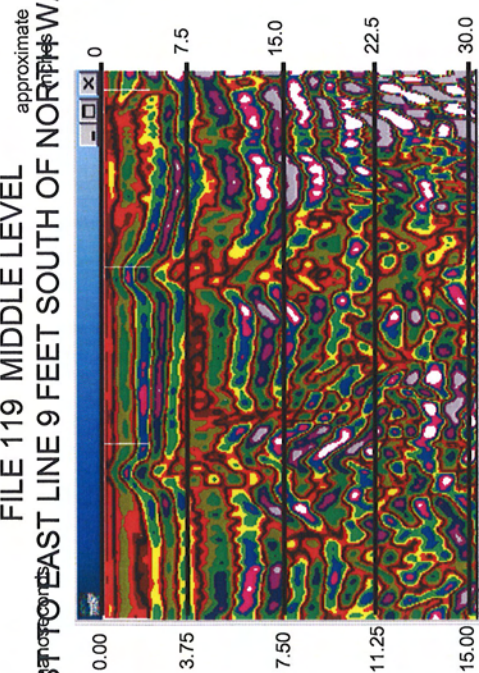
FILE 133 "NORTH PASSAGE UPSTAIRS"
SOUTH TO NORTH LINE BEGIN AT SOUTH WALL
APPROXIMATELY 75 FEET EAST OF WEST WALL



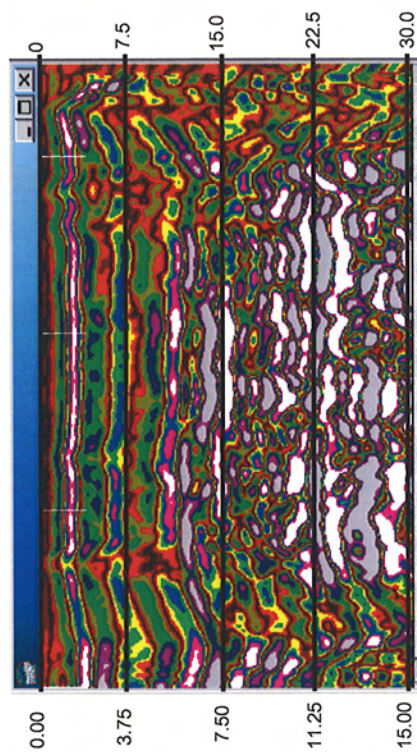
FILE 118 MIDDLE LEVEL
NORTH TO SOUTH LINE NEAR FRONT DOOR



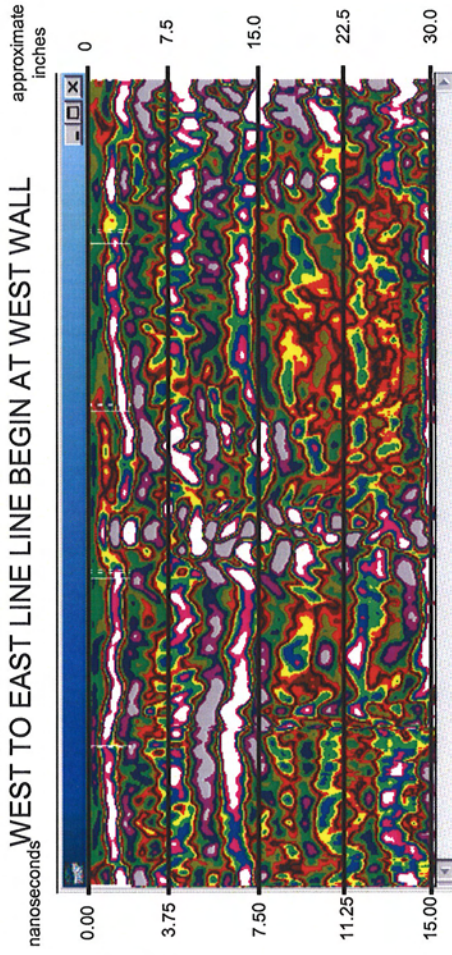
FILE 119 MIDDLE LEVEL
WEST TO EAST LINE 9 FEET SOUTH OF NORTH WALL



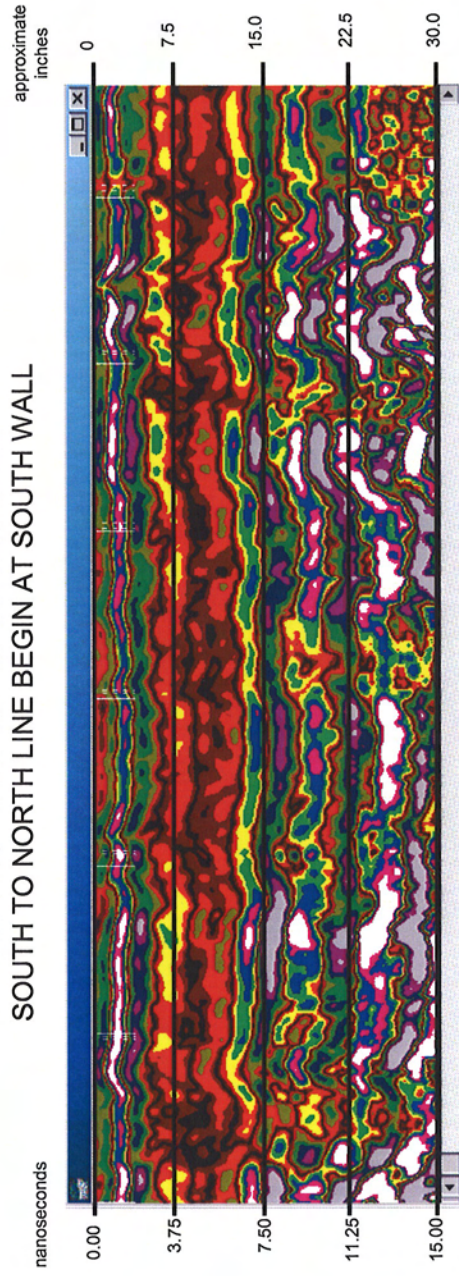
FILE 120 MIDDLE LEVEL
WEST TO EAST LINE 30 FEET SOUTH OF NORTH WALL



FILE 136 "MENS ROOM" LOWER LEVEL
WEST TO EAST LINE BEGIN AT WEST WALL



FILE 138 "MENS ROOM" LOWER LEVEL
SOUTH TO NORTH LINE BEGIN AT SOUTH WALL



APPENDIX A
ANALYSIS CALCULATIONS

CALCULATION COVER SHEET

Client: City of Pawtucket, RI Project Name: Pawtucket/Central FallsProject/Calculation Number: 10160343.02000Title: Girder Analysis

Total Number of Pages (including cover sheet): _____

Total Number of Computer Runs: 0Prepared by: Jack Cash *J. Cash* Date: 06/14/06Checked by: _____ *Larry Centini* Date: 6/23/06Description and Purpose: Analysis of Station Support Girders for Pawtucket/Central Falls Feasibility Study

Design Basis/References/Assumptions

IBC 2003/RI State Building Code

AISC – 9th Edition

Field Inspection and Measurements

Existing Architectural Plans, Pawtucket-Central Falls, Shts 1, 14, 15,
18, 19, 20, 21

Nondestructive Test Report, NDT Corporation, May 2006

Remarks/Conclusions/Results:

Calculation Approved by: _____

*[Signature]*6/23/06

Project Manager/Date

Revision No.:

Description of Revision:

Approved by:

Project Manager/Date

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| LOAD SUMMARY..... | 10 |
| SUMMARY OF GIRDER STRESSES..... | 14 |
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Description GIRDER ANALYSISComputed by JCSheet 1 of ____Checked by LCDate 6/11/06Date 6/23/06

Reference

PRELIMINARY ANALYSIS OF BUILDING SUPPORT GIRDERS SPANNING TRACKS

NO STRUCTURAL PLANS OF THE EXISTING STATION ARE AVAILABLE AT THIS TIME. THEREFORE, THESE CALCULATIONS ARE BASED ON VISUAL MEASUREMENTS AND INSPECTIONS OF THE EXISTING GIRDERS SUPPORTING THE EXISTING STATION AT PAWTUCKET/CENTRAL FALLS. SOME ARCHITECTURAL DRAWING ARE AVAILABLE AND ARE USED TO DEVELOP APPROXIMATE BUILDING LOADS. IN ADDITION, NON-DESTRUCTIVE TESTING WAS PERFORMED TO EVALUATE PROPERTIES OF THE EXISTING CONCRETE FLOOR SLABS.

THIS ANALYSIS IS BEING PERFORMED AS PART OF A FEASIBILITY STUDY TO EVALUATE THE EXISTING ABANDONED STATION STRUCTURE FOR FUTURE USE AS AN OPERATING COMMUTER RAIL STATION. AS SUCH, THE CALCULATED LOADS AND STRESSES ARE APPROXIMATE AND MEANT TO INDICATE AREAS WHERE EXTENSIVE STRENGTHENING MAY BE REQUIRED.

THIS IS A GRAVITY LOAD ANALYSIS ONLY INCLUDING APPROXIMATE DEAD LOADS, LIVE LOADS, AND SNOW LOADS. A WIND AND/OR SEISMIC ANALYSIS IS BEYOND THE SCOPE OF THIS ANALYSIS.

URS

Job PAWTUCKET/CENTRAL FALLS Project No. 10160343
Description GIRDER ANALYSIS Computed by JL
Checked by LC

Page ____ of ____
Sheet 1A of ____
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Date 6/23/06
Reference

STA BUILT CIRCA "1916"

Strength of Steel Estimated

REF 1 - AASHTO MAINT MANUAL Table 6.6.2.1

1905-1936 $F_y = 30 \text{ ksi}$ $F_u = 60 \text{ ksi}$

DEAD LOADSFLOORS

(REF: "NONDESTRUCTIVE TESTING INVESTIGATION", NDT)
 RESULTS FROM NON-DESTRUCTIVE TESTING
 INDICATE THE EXISTING FLOOR SLABS
 TO BE 7 1/2" TO 8 1/2" CONCRETE SLABS. THE
 SLAB OVER THE TRACKS IS SUPPORTED ON
 STEEL BEAMS SPACED APPROXIMATELY 5'-9" O.C.

$$DL (8 1/2" \text{ SLAB} + 1/2" \text{ TILE}) \approx (9/12)(150 \text{ PCF}) = 112.5 \text{ PSF}$$

INCLUDING SUPPORT BEAMS, USE; $W_{DL} = 125 \text{ PSF}$

TESTING IN THE UPPER LEVEL OF THE NORTH
 PASSAGE INDICATED AN AVG FLOOR THICKNESS
 OF $\approx 6"$. (NO TILE)

$$\therefore \text{USE: } (6/12)(150) = 75 \text{ PSF} + 10 \text{ PSF}^{\downarrow \text{SUPPORT BEAM}} = 85 \text{ PSF}$$

WALLS

EXISTING WALLS ARE A COMBINATION OF BRICK
 AND CLAY TILES. USE THE FOLLOWING UNIT
 LOADS TO CALCULATE DL DUE TO WALLS (AISC)

| | | | | |
|----------|---------|---------|--------|--------|
| 4" WALL | 40 PSF |] BRICK | 25 PSF |] TILE |
| 8" WALL | 80 PSF | | 33 PSF | |
| 12" WALL | 120 PSF | | 45 PSF | |
| 16" WALL | 160 PSF | | | |

WALL SUPPORTED BY G1

(REF: ARCH. PLANS, SHTS 14 & 20)

EXISTING WALL HAS 8'x4' OPENINGS SPACED
 @ 10' O.C. AND IS APPROX. 12" THICK.

DEAD LOADS (CONT)

$$WALL\ HGT = 8.4'$$

FOR 10' SPAN,

$$A_{WALL} = 84\ SF.$$

$$A_{NET} \approx 84 - (8' \times 4') = 52\ SF$$

$$A_{NET}/A_{WALL} = 52/84 = 0.62 \rightarrow \text{USE } 0.65$$

$$\therefore W_{DL} \approx 0.65 (8.4') (120\ PSF) = 0.66\ K/FT$$

WALL SUPPORTED BY G2

ASSUME UPPER PORTION OF WALL IS CONSTRUCTED OF 8" BRICK. THIS WALL HAS LARGE OPENINGS @ 10' O.C.

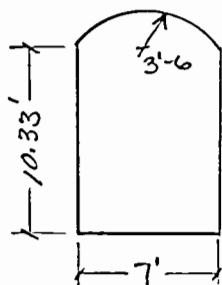
$$WALL\ HGT \approx 24.86'$$

$$A_{WALL} = 248.6\ SF\ (10'\ \text{SECTION})$$

$$A_{OPEN} \approx (10.33 \times 7.0) + \frac{\pi r^2}{2} = 91.6\ SF$$

$$A_{NET} = 248.6 - 91.6 = 157\ SF$$

$$A_N/A_G = 157/248.6 = 0.63 \rightarrow \text{USE } 0.65$$



$$\therefore W_{DL} \approx 0.65 (80\ PSF) (24.86) = 1.29\ K/FT$$

LOWER PORTION OF WALL IS ASSUMED TO BE 16" THICK. NEGL OPENINGS,

$$W_{DL} \approx 8.4 (160\ PSF) = 1.34\ K/FT$$

DEAD LOADS (CONT.)WALL SUPPORTED BY G6

NEGL. SMALL OPENINGS IN WALL

$$WDL \text{ (UPPER)} = (33.24' - 8.72') (80^{PSF}) = 1.96 \text{ K/FT}$$

8" WALL

$$WDL \text{ (LOWER)} = (8.72') (160^{PSF}) = 1.40 \text{ K/FT}$$

16" WALL

WALL SUPPORTED BY G7

EXISTING DWGS INDICATE THESE WALLS TO BE 8" T.C.

$$WDL \text{ (UPPER)} = (11.52') (33^{PSF}) = 0.38 \text{ K/FT}$$

$$WDL \text{ (LOWER)} = (8.72') (33^{PSF}) = 0.28 \text{ K/FT}$$

WALL SUPPORTED BY G8

THIS 12" WALL HAS 8' x 4' OPENINGS @ 10' O.C.

$$\therefore WDL \text{ (UPPER)} = (11.52') (120^{PSF}) (0.65) = 0.90 \text{ K/FT}$$

$$WDL \text{ (LOWER)} = (8.72') (120^{PSF}) (0.65) = 0.68 \text{ K/FT}$$

ROOF DEAD LOADS

MAIN ROOF IS A STANDING SEAM METAL ROOF
SUPPORTED ON STEEL JOISTS SPACED AT
APPROXIMATELY 10' O.C.

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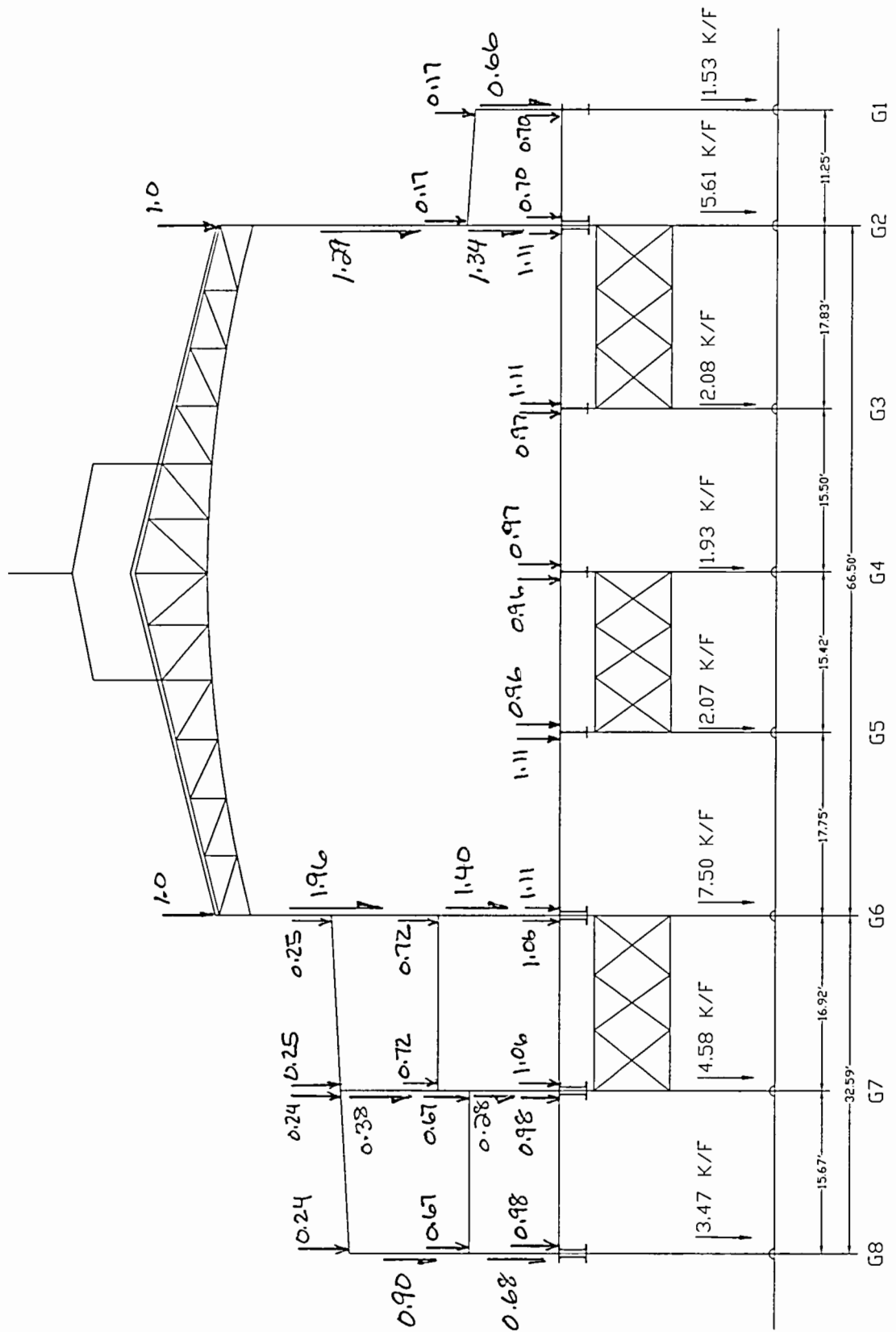
Reference

DEAD LOADS (CONT)

THE PASSAGE WAY ROOFS ARE SLAG ROOFS
SUPPORTED BY ENCASED STEEL BEAMS SPACED
APPROXIMATELY 5'-9" O.C.

FOR THIS FEASIBILITY STUDY, ASSUME ALL
ROOF DEAD LOADS TO BE 30 PSF.

DEAD LOADS



JC 6/11/06
 CKD LC 6/23/06

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Reference

LIVE LOADS

FROM SECTION 1607 OF THE 2003 IBC
BUILDING CODE, FOR ASSEMBLY AREAS,
LOBBIES, AND CORRIDORS, USE A
UNIFORM LIVE LOAD FOR DESIGN OF:

$$W_L = 100 \text{ PSF}$$

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 Checked by LC

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 Reference

SNOW LOADS

From RI STATE BLDG CODE & IBC 2003:

$$P_g = 30 \text{ PSF}, \quad \frac{I}{S} = 1.10$$

↑ IBC 2003, TABLE 1604.5

From ASCE 7-02, SECTION 7.0, FOR FLAT ROOFS,

$$P_f = 0.7 C_e C_t I P_g$$

$$C_e \text{ (EXPOSURE FACTOR)} = 0.9$$

$$C_t \text{ (THERMAL FACTOR)} = 1.0$$

$$\therefore P_f = (0.7)(0.9)(1.0)(1.1) 30 \text{ PSF} = 20.8 \text{ PSF}$$

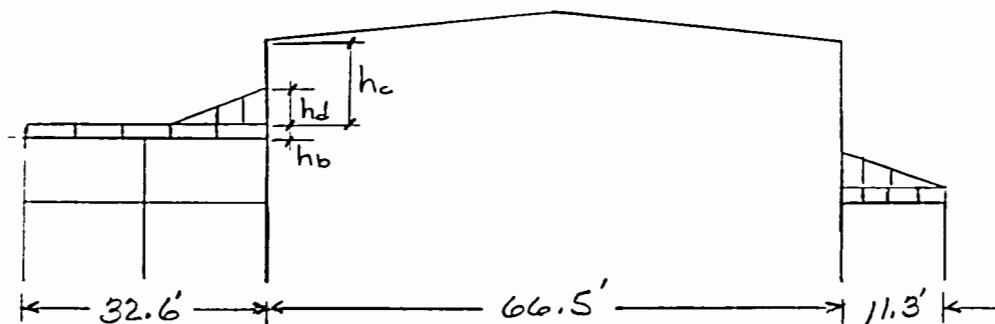
HOWEVER, FOR $P_g > 20 \text{ PSF}$,

$$P_f (\text{min}) = (20 \text{ PSF}) I = 22 \text{ PSF}$$

ROOF OVER WAITING ROOM HAS AN APPROXIMATE SLOPE OF $14^\circ < 15^\circ \Rightarrow \text{MIN-SLOPE ROOF}$

\therefore USE $P_f = 22 \text{ PSF}$ FOR ALL ROOFS

DRIFTING ON LOWER ROOFS



Job PAWTUCKET/CENTRAL FALLSProject No. 10160343

Page ____ of ____

Description GIRDER ANALYSISComputed by JCSheet 9 of ____Date 6/11/06Checked by LCDate 6/23/06

Reference

LEEWARD WIND (ASCE 7-02, 7.7.1)

$$\gamma_s = 0.13 P_g + 14 = 0.13 (30 \text{ psf}) + 14 = 17.9 \text{ psf} < 30 \text{ psf}$$

$$\therefore h_b = P_g / \gamma_s = 22 \text{ psf} / 17.9 = 1.23'$$

From ASCE 7-02, FIG 7-9, For $L_u \approx 66.5'$,

$$h_d \approx 2.8' \Rightarrow P_d \approx 50 \text{ psf}$$

WINDWARD WIND

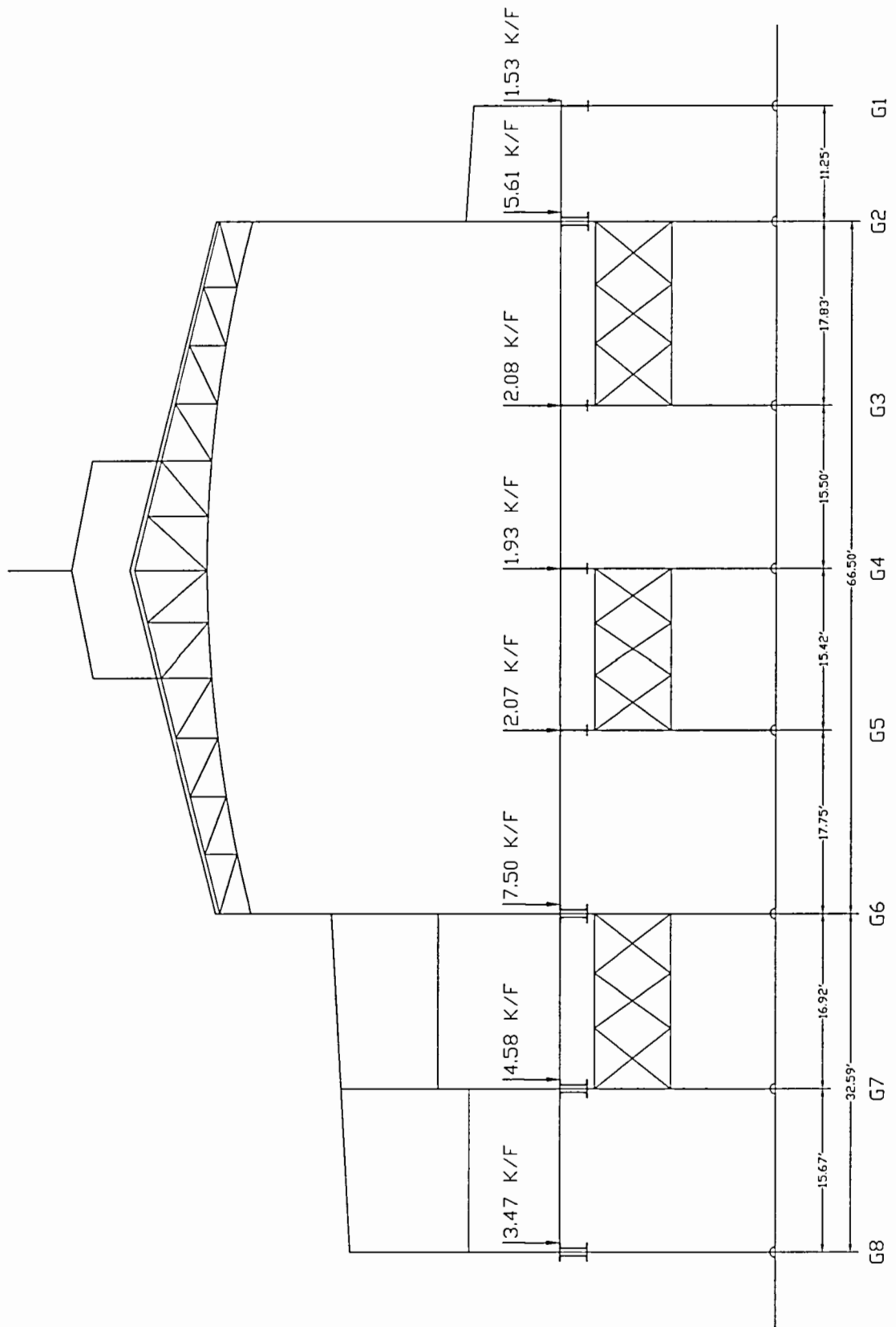
$$\text{Assume } L_u \approx 32.6' \Rightarrow h_d = 1.9'$$

 \therefore LEEWARD SNOW DRIFTING GOVERNS

DISTRIBUTE SNOW DRIFT OVER WIDTH,

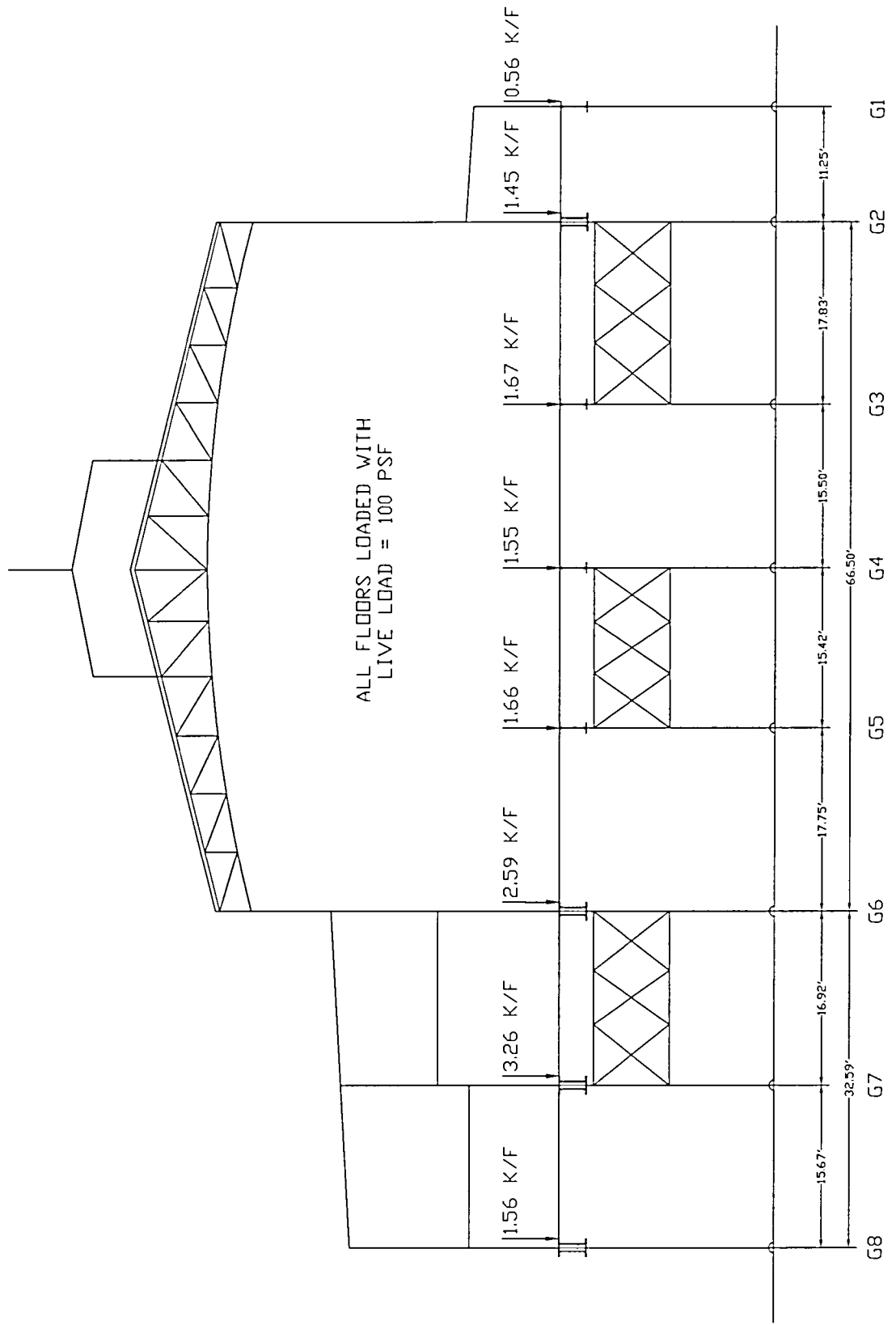
$$4h_d = 4(2.8') = 11.2' \quad (h_d \leq h_c)$$

DEAD LOAD SUMMARY



By JC 6/11/06 10/
 Cld LC 6/23/06

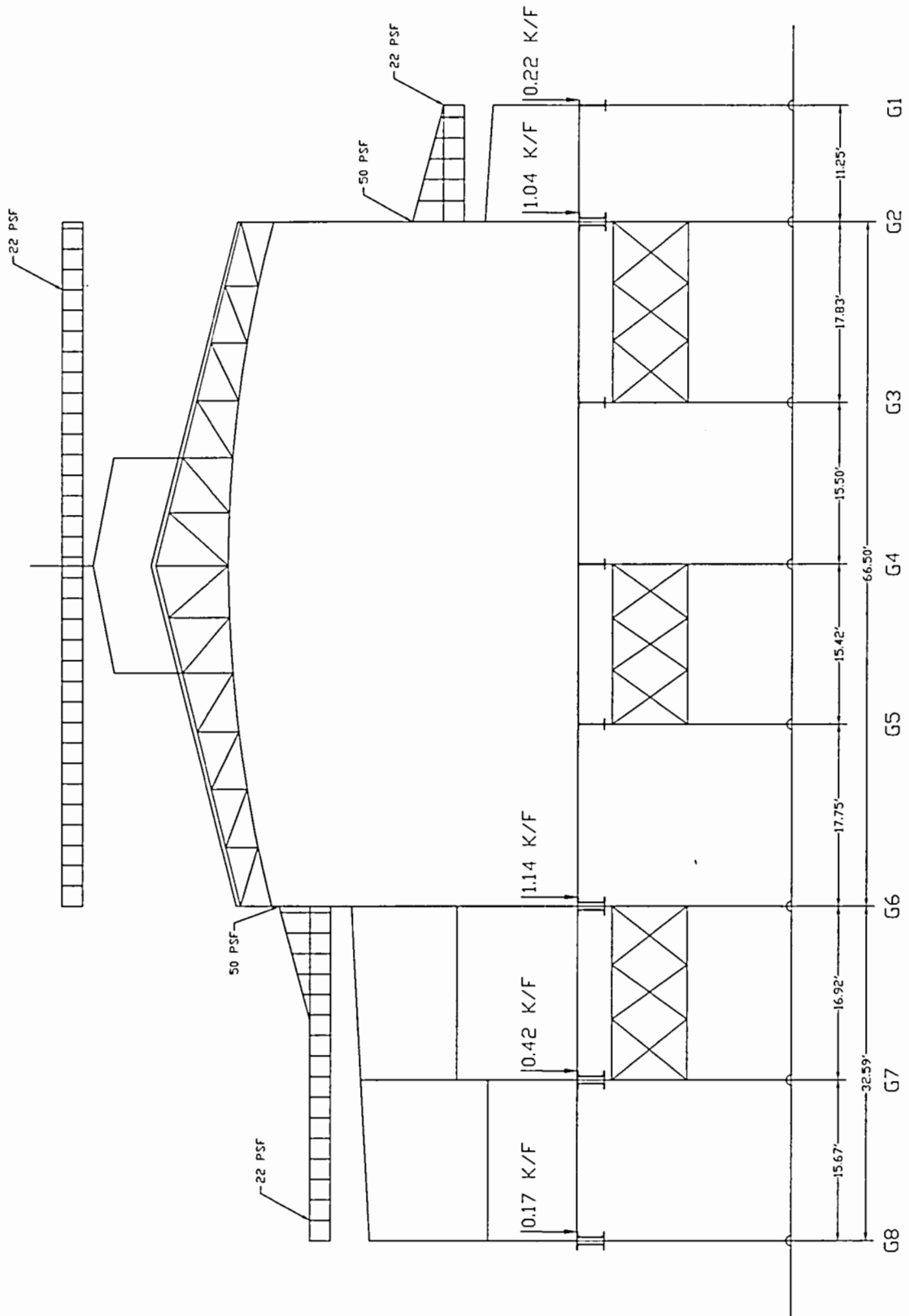
LIVE LOAD SUMMARY



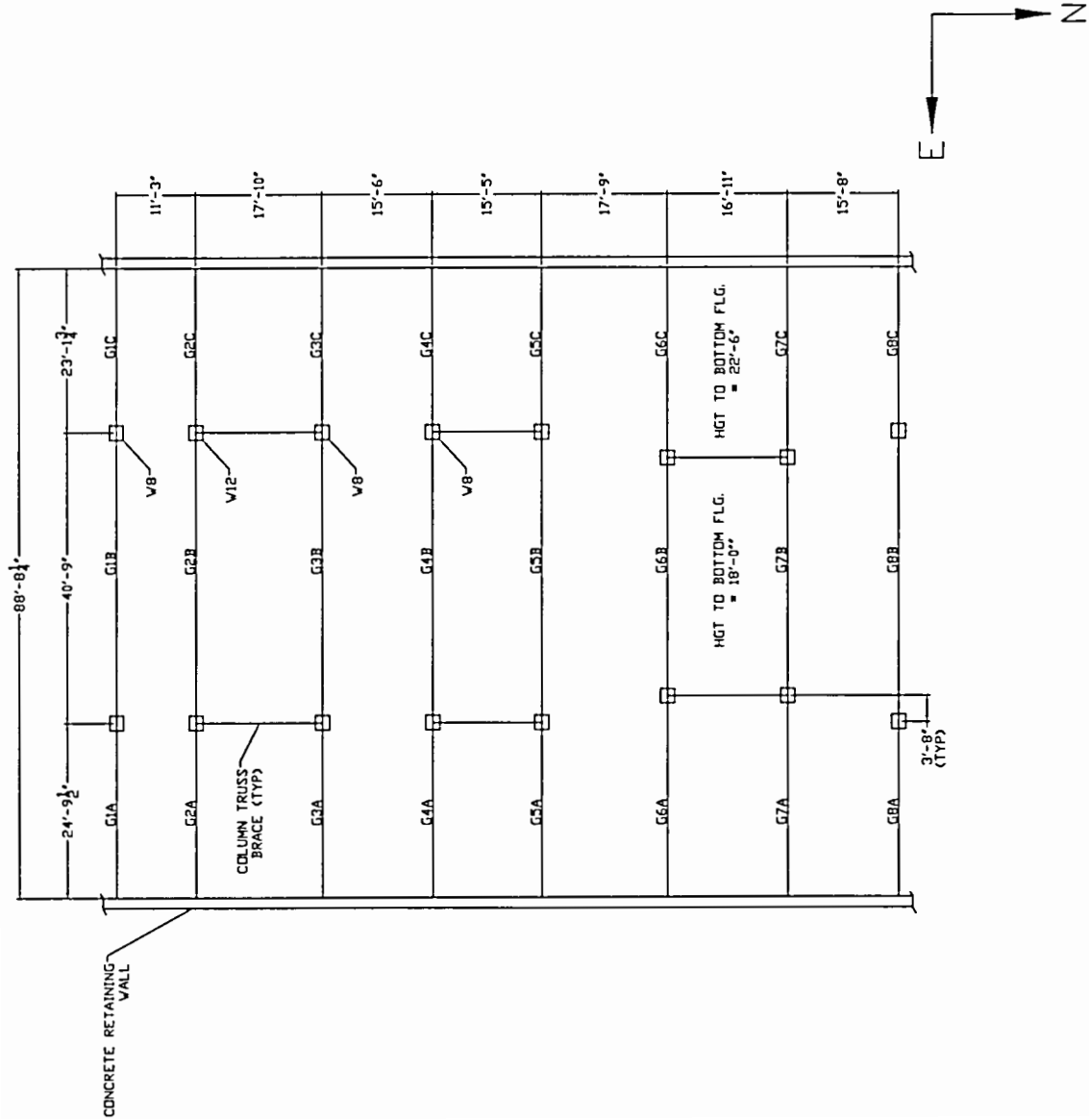
BY JC 6/11/06
CHK LC 6/23/06 11/

By JC 6/11/06 12/
 CHK LC 6/23/06

SNOW LOAD SUMMARY



By JC 6/11/06 13/
CHK LC 6/23/06



PLAN VIEW - SUPPORT GIRDERS OVER TRAIN TRACKS

NOTE: FROM FIELD MEASUREMENTS.

| | | | | | |
|--|--|-------------------------------|--|-----------------------|--|
| URS Corp | | PAGE: _____ | | OF: _____ | |
| | | SHEET NO: 14 | | OF: _____ | |
| PROJECT: | | JOB NO: 10160343.02000 | | | |
| SUBJECT: | | MADE BY: JC | | | |
| FILE: J:\10160343_Pawtucket\Structural\Task 2\Inspection Report\Pawtucket Girders\Stresses.xls\Sheet1 | | CHK'D BY: JC | | DATE: 06/23/06 | |
| | | DATE: 6/23/06 | | | |

PAWTUCKET/CENTRAL FALLS

ANALYSIS OF PLATE GIRDERS - EFFECTIVE SECTIONS

| GIRDER | DEAD LD | LIVELD | SNOW LD | *BM WGT | TOTAL | SPAN | Vmax k | Vmax k-ft | S (in ²) | Aw (in ²) | f(v) (ksi) | f(b) (ksi) | ***Fy (ksi) | **Fb (ksi) | **Fv (ksi) | %OVERSTRESS (Bending) | %OVERSTRESS (Shear) |
|--------|---------|--------|---------|---------|-------|-------|-----------|--------------|-------------------------|--------------------------|---------------|---------------|----------------|---------------|---------------|--------------------------|------------------------|
| G1A | 1.53 | 0.56 | 0.22 | 0.09 | 2.40 | 24.79 | 29.72 | 184.21 | 142.32 | 7.50 | 4.0 | 15.5 | 30.0 | 18.0 | 12.0 | | |
| G1B | 1.53 | 0.56 | 0.22 | 0.18 | 2.49 | 40.75 | 50.65 | 516.02 | 306.93 | 7.80 | 6.5 | 20.2 | 30.0 | 18.0 | 12.0 | 12.1 | |
| G1C | 1.53 | 0.56 | 0.22 | 0.09 | 2.40 | 23.15 | 27.76 | 160.64 | 142.32 | 7.50 | 3.7 | 13.5 | 30.0 | 18.0 | 12.0 | | |
| G2A | 5.61 | 1.45 | 1.04 | 0.25 | 8.35 | 24.79 | 103.54 | 641.66 | 433.61 | 11.14 | 9.3 | 17.8 | 30.0 | 18.0 | 12.0 | | |
| G2B | 5.61 | 1.45 | 1.04 | 0.33 | 8.43 | 40.75 | 171.76 | 1749.82 | 696.69 | 14.27 | 12.0 | 30.1 | 30.0 | 18.0 | 12.0 | 67.4 | 100.3 |
| G2C | 5.61 | 1.45 | 1.04 | 0.25 | 8.35 | 23.15 | 96.69 | 559.57 | 433.61 | 11.14 | 8.7 | 15.5 | 30.0 | 18.0 | 12.0 | | |
| G3A | 2.08 | 1.67 | 0 | 0.11 | 3.86 | 24.79 | 47.84 | 298.52 | 171.98 | 9.00 | 5.3 | 20.7 | 30.0 | 18.0 | 12.0 | 14.9 | |
| G3B | 2.08 | 1.67 | 0 | 0.21 | 3.96 | 40.75 | 80.66 | 821.77 | 519.99 | 9.72 | 8.3 | 19.0 | 30.0 | 18.0 | 12.0 | 5.4 | |
| G3C | 2.08 | 1.67 | 0 | 0.11 | 3.86 | 23.15 | 44.68 | 258.58 | 171.98 | 9.00 | 5.0 | 18.0 | 30.0 | 18.0 | 12.0 | 0.2 | |
| G4A | 1.93 | 1.55 | 0 | 0.11 | 3.59 | 24.79 | 44.50 | 275.78 | 150.82 | 9.00 | 4.9 | 21.9 | 30.0 | 18.0 | 12.0 | 21.9 | |
| G4B | 1.93 | 1.55 | 0 | 0.21 | 3.69 | 40.75 | 75.16 | 765.73 | 551.08 | 9.72 | 7.7 | 16.7 | 30.0 | 18.0 | 12.0 | | |
| G4C | 1.93 | 1.55 | 0 | 0.11 | 3.59 | 23.15 | 41.55 | 240.50 | 150.82 | 9.00 | 4.6 | 19.1 | 30.0 | 18.0 | 12.0 | 6.3 | |
| G5A | 2.07 | 1.66 | 0 | 0.11 | 3.84 | 24.79 | 47.60 | 294.98 | 183.14 | 9.00 | 5.3 | 18.3 | 30.0 | 18.0 | 12.0 | 1.8 | |
| G5B | 2.07 | 1.66 | 0 | 0.21 | 3.94 | 40.75 | 80.28 | 817.62 | 551.08 | 9.72 | 8.3 | 17.8 | 30.0 | 18.0 | 12.0 | | |
| G5C | 2.07 | 1.66 | 0 | 0.11 | 3.84 | 23.15 | 44.45 | 257.24 | 193.14 | 9.00 | 4.9 | 16.0 | 30.0 | 18.0 | 12.0 | | |
| G6A | 7.5 | 2.59 | 1.14 | 0.24 | 11.47 | 28.40 | 163.25 | 1161.50 | 401.13 | 10.90 | 15.0 | 34.7 | 30.0 | 18.0 | 12.0 | 93.0 | 124.8 |
| G6B | 7.5 | 2.59 | 1.14 | 0.29 | 11.52 | 33.41 | 192.37 | 1606.81 | 598.12 | 13.16 | 14.6 | 32.2 | 30.0 | 18.0 | 12.0 | 79.1 | 121.8 |
| G6C | 7.5 | 2.59 | 1.14 | 0.24 | 11.47 | 26.82 | 153.84 | 1031.49 | 401.13 | 10.90 | 14.1 | 30.9 | 30.0 | 18.0 | 12.0 | 71.4 | 117.6 |
| G7A | 4.58 | 3.26 | 0.42 | 0.17 | 8.43 | 28.46 | 119.89 | 853.00 | 419.27 | 17.40 | 6.9 | 24.4 | 30.0 | 18.0 | 12.0 | 35.6 | |
| G7B | 4.58 | 3.26 | 0.42 | 0.22 | 8.48 | 33.41 | 141.66 | 1183.20 | 500.13 | 19.44 | 7.3 | 28.4 | 30.0 | 18.0 | 12.0 | 57.7 | |
| G7C | 4.58 | 3.26 | 0.42 | 0.17 | 8.43 | 26.82 | 112.98 | 757.53 | 419.27 | 17.40 | 6.5 | 21.7 | 30.0 | 18.0 | 12.0 | 20.5 | |
| G8A | 3.47 | 1.58 | 0.17 | 0.20 | 5.40 | 24.79 | 66.91 | 414.66 | 287.67 | 18.15 | 3.7 | 17.3 | 30.0 | 18.0 | 12.0 | | |
| G8B | 3.47 | 1.58 | 0.17 | 0.40 | 5.60 | 40.75 | 114.02 | 1161.56 | 1047.65 | 19.73 | 5.8 | 13.3 | 30.0 | 18.0 | 12.0 | | |
| G8C | 3.47 | 1.58 | 0.17 | 0.20 | 5.40 | 23.15 | 62.48 | 361.61 | 287.67 | 18.15 | 3.4 | 15.1 | 30.0 | 18.0 | 12.0 | | |

* Includes 10% additional for stiffeners and connections.

** AISC Fb=0.6Fy, Fv=0.4Fy.

** See sheet 1A.

URS Corp

PAGE: _____

OF: _____

PROJECT:

SHEET NO: 14A

OF: _____

SUBJECT:

JOB NO: 10160343.02000

MADE BY: JC

DATE: 06/26/06

FILE: C:\Documents and Settings\JCash\Desktop\Pawluicket Column Analysis.xls\Sheet1

CHK'D BY: JC DATE: 6/26/06

| COLUMN | SIZE | AREA (in ²) | r (in) | ** L (ft) | KL/r | GIRDER | DEAD LD | LIVE LD | SNOW LD | * BM WGT | TOTAL (k/ft) | SPAN | Vmax k | Pmax k | Fy (ksi) | ** Fa (ksi) | fa (ksi) | % OVERSTRESS |
|--------|---------|----------------------------|-----------|--------------|-------|------------|--------------|--------------|--------------|--------------|-----------------|----------------|------------------|-----------|-------------|----------------|-------------|--------------|
| C1A | W8X35 | 10.3 | 2.03 | 16.8 | 99.01 | G1A | 1.53 | 0.56 | 0.22 | 0.09 | 2.40 | 24.79 | 29.72 | 80.38 | 30.0 | 11.80 | 7.80 | |
| C1C | do | 10.3 | 2.03 | 16.8 | 99.01 | G1B G1C | 1.53 1.53 | 0.56 0.56 | 0.22 0.22 | 0.18 0.09 | 2.49 2.40 | 40.75 23.15 | 50.65 27.76 | 78.41 | 30.0 | 11.80 | 7.61 | |
| C2A | W10X100 | 29.4 | 2.65 | 16.8 | 75.85 | G2A | 5.61 | 1.45 | 1.04 | 0.26 | 8.36 | 24.79 | 103.67 | 275.43 | 30.0 | 13.76 | 9.37 | |
| C2C | do | 29.4 | 2.65 | 16.8 | 75.85 | G2B G2C | 5.61 5.61 | 1.45 1.45 | 1.04 1.04 | 0.33 0.26 | 8.43 8.36 | 40.75 23.15 | 171.76 96.81 | 268.57 | 30.0 | 13.76 | 9.14 | |
| C3A | W8X35 | 10.3 | 2.03 | 16.8 | 99.01 | G3A | 2.08 | 1.67 | 0 | 0.11 | 3.86 | 24.79 | 47.84 | 128.51 | 30.0 | 11.80 | 12.48 | 5.7 |
| C3C | do | 10.3 | 2.03 | 16.8 | 99.01 | G3B G3C | 2.08 2.08 | 1.67 1.67 | 0 0 | 0.21 0.11 | 3.96 3.86 | 40.75 23.15 | 80.66 44.68 | 125.34 | 30.0 | 11.80 | 12.17 | 3.1 |
| C4A | do | 10.3 | 2.03 | 16.8 | 99.01 | G4A | 1.93 | 1.55 | 0 | 0.11 | 3.59 | 24.79 | 44.50 | 119.66 | 30.0 | 11.80 | 11.62 | |
| C4C | do | 10.3 | 2.03 | 16.8 | 99.01 | G4B G4C | 1.93 1.93 | 1.55 1.55 | 0 0 | 0.21 0.11 | 3.69 3.59 | 40.75 23.15 | 75.16 41.55 | 116.72 | 30.0 | 11.80 | 11.33 | |
| C5A | do | 10.3 | 2.03 | 16.8 | 99.01 | G5A | 2.07 | 1.66 | 0 | 0.11 | 3.84 | 24.79 | 47.60 | 127.85 | 30.0 | 11.80 | 12.41 | 5.2 |
| C5C | do | 10.3 | 2.03 | 16.8 | 99.01 | G5B G5C | 2.07 2.07 | 1.66 1.66 | 0 0 | 0.21 0.11 | 3.94 3.84 | 40.75 23.15 | 80.26 44.45 | 124.71 | 30.0 | 11.80 | 12.11 | 2.6 |
| C6A | W12X106 | 31.2 | 3.11 | 16.8 | 64.63 | G6A | 7.5 | 2.59 | 1.14 | 0.24 | 11.47 | 28.46 | 163.25 | 355.62 | 30.0 | 14.60 | 11.40 | |
| C6C | do | 31.2 | 3.11 | 16.8 | 64.63 | G6B G6C | 7.5 7.5 | 2.59 2.59 | 1.14 1.14 | 0.29 0.24 | 11.52 11.47 | 33.41 26.82 | 192.37 153.84 | 346.21 | 30.0 | 14.60 | 11.10 | |
| C7A | W10X100 | 29.4 | 2.65 | 16.8 | 75.85 | G7A | 4.58 | 3.26 | 0.42 | 0.22 | 8.48 | 28.46 | 120.67 | 262.33 | 30.0 | 13.76 | 8.92 | |
| C7C | do | 29.4 | 2.65 | 16.8 | 75.85 | G7B G7C | 4.58 4.58 | 3.26 3.26 | 0.42 0.42 | 0.22 0.22 | 8.48 8.48 | 33.41 26.82 | 141.66 113.72 | 255.38 | 30.0 | 13.76 | 8.69 | |
| C8A | W10X68 | 20.0 | 2.59 | 16.8 | 77.61 | G8A | 3.47 | 1.56 | 0.17 | 0.20 | 5.40 | 24.79 | 66.91 | 180.93 | 30.0 | 13.62 | 9.05 | |
| C8C | do | 20.0 | 2.59 | 16.8 | 77.61 | G8B G8C | 3.47 3.47 | 1.56 1.56 | 0.17 0.17 | 0.40 0.20 | 5.60 5.40 | 40.75 23.15 | 114.02 62.48 | 176.50 | 30.0 | 13.62 | 8.83 | |

* Includes 10% additional for stiffeners and connections.

** AISC 9th ED, CHAPTER E

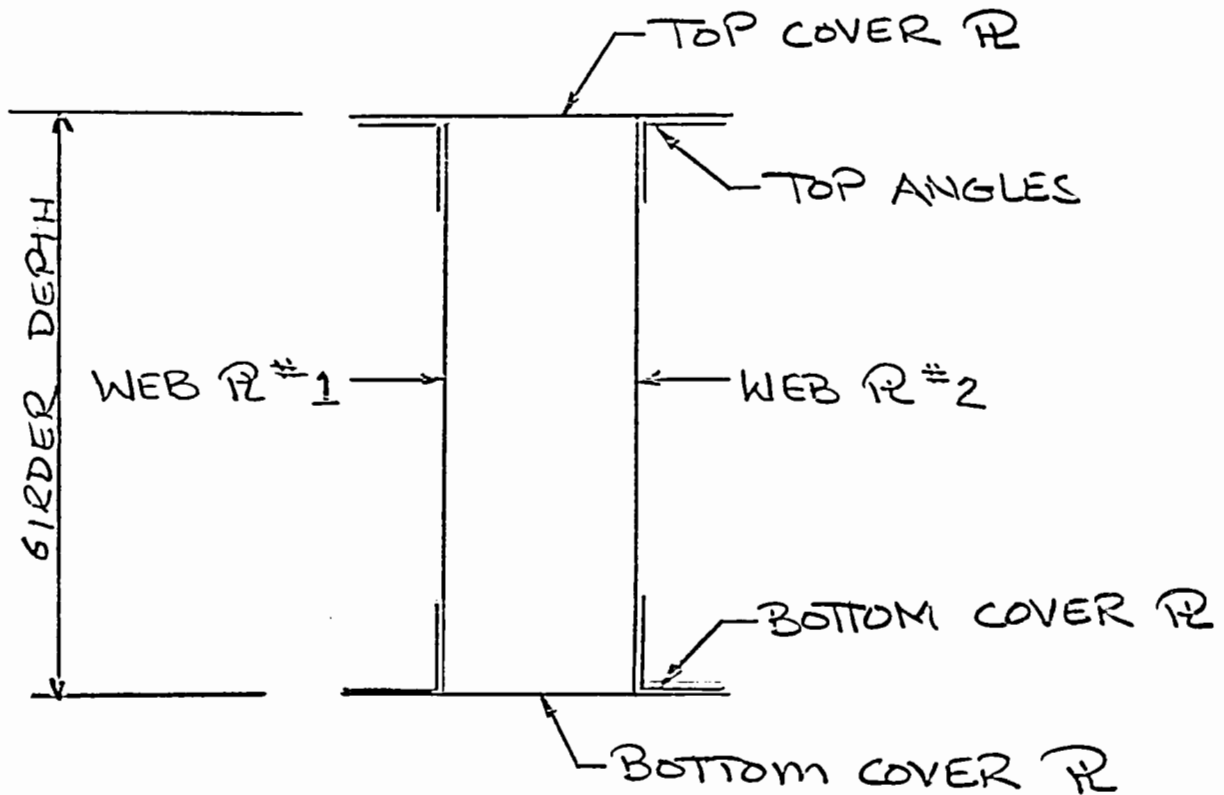
*** FIELD MEASURED

Job PAWTUCKET/CENTRAL FALLS Project No. 10160343
Description GIRDER ANALYSIS Computed by JC
Checked by LC

Page of
Sheet 15 of
Date 6/11/06
Date 6/23/06

Reference

SECTION PROPERTIES MODEL



APPENDIX A

GIRDER SECTION PROPERTIES

URS Corp.
38 Chauncy St., 5th Fl.
Boston, MA 02111

Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A1 of A32
Calculated By: JPC Date: 06/09/2006
Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder

G1C

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|-----------|----------------------|------------|------------------------|-----------------------|------------------------|-------------------------|
| | | | | t | A | | | | | |
| Top Cover Plate | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Top Angles | 2L6x4x3/8 | 100 | | | 7.2 in ² | 24.06 in | 173.71 in ³ | 11.56 in ³ | 27.00 in ⁴ | 964.67 in ⁴ |
| Web 1 | 25x3/8 | 100 | 25.00 | 0.375 | 9.4 in ² | 12.50 in | 117.19 in ³ | 0.00 in ³ | 488.28 in ⁴ | 0.00 in ⁴ |
| Web 2 | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Bot. Angles | 2L6x4x3/8 | 100 | | | 7.2 in ² | 0.94 in | 6.79 in ³ | 11.56 in ³ | 27.00 in ⁴ | 964.67 in ⁴ |
| Bottom Cover Plate | - | | 0.00 | 0.000 | 0.00 in | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| | | | | | 23.8 in ² | | 297.69 in ³ | | 542.28 in ⁴ | 1929.34 in ⁴ |
| | | | | | | Y= | 12.50 in | | I= | 2471.62 in ⁴ |
| | | | | | D (max) | D-Y= | 12.50 in | | S _{xt} = | 197.73 in ³ |
| | | | | | | c= | 12.50 in | | S _{xb} = | 197.73 in ³ |
| | | | | | BM WGT= | 0.081 K/Ft | | | F _y = | 30.00 ksi |

URS Corp.
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Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A2 of
Calculated By: JPC Date: 06/09/2006
Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder G1C-R

| | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-------------|-------------|-----------|----------------------|---------------------|------------------------|-----------------------|------------------------|-------------------------|
| | | | t | A | | | | | |
| Top Cover Plate | - | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Top Angles | 2L6x4x3/8 | 70 | | 5.1 in ² | 24.06 in | 121.59 in ³ | 11.56 in ³ | 18.90 in ⁴ | 675.27 in ⁴ |
| Web 1 | 25x3/8 | 80 | 25.00 | 0.300 | 7.5 in ² | 12.50 in | 93.75 in ³ | 0.00 in ³ | 390.63 in ⁴ |
| Web 2 | - | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Bot. Angles | 2L6x4x3/8 | 70 | | 5.1 in ² | 0.94 in | 4.76 in ³ | 11.56 in ³ | 18.90 in ⁴ | 675.27 in ⁴ |
| Bottom Cover Plate | - | 0.00 | 0.000 | 0.00 in | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| | | | | 17.6 in ² | | 220.10 in ³ | | 428.43 in ⁴ | 1350.53 in ⁴ |
| | | | | | Y= | 12.50 in | | I= | 1778.96 in ⁴ |
| D (max) | | | | 25.00 | D-Y= | 12.50 in | | S _{xt} = | 142.32 in ³ |
| | | | | | c= | 12.50 in | | S _{xb} = | 142.32 in ³ |
| BM WGT= | | | | 0.060 K/Ft | | | | F _y = | 30.00 ksi |

URS Corp.
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Boston, MA 02111

Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A3 of
Calculated By: JPC Date: 06/09/2006
Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder G1B

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|-----------|----------------------|----------|------------------------|-----------------------|------------------------|-------------------------|
| | | | | t | A | | | | | |
| Top Cover Plate | 14x1/2 | 100 | 14.00 | 0.500 | 7.0 in ² | 26.75 in | 187.25 in ³ | 13.25 in ³ | 0.15 in ⁴ | 1228.94 in ⁴ |
| Top Angles | 2L6x6x1/2 | 100 | | | 11.5 in ² | 24.82 in | 285.43 in ³ | 11.32 in ³ | 39.80 in ⁴ | 1473.64 in ⁴ |
| Web 1 | 26x3/8 | 100 | 26.00 | 0.375 | 9.8 in ² | 13.50 in | 131.63 in ³ | 0.00 in ³ | 549.25 in ⁴ | 0.00 in ⁴ |
| Web 2 | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Bot. Angles | 2L6x6x1/2 | 100 | | | 11.5 in ² | 2.18 in | 25.07 in ³ | 11.32 in ³ | 39.80 in ⁴ | 1473.64 in ⁴ |
| Bottom Cover Plate | 14x1/2 | 100 | 14.00 | 0.500 | 7.00 in | 0.25 in | 1.75 in ³ | 13.25 in ³ | 0.15 in ⁴ | 1228.94 in ⁴ |
| | | | | | 46.8 in ² | | 631.13 in ³ | | 629.14 in ⁴ | 5405.15 in ⁴ |
| | | | | | | Y= | 13.50 in | | I= | 6034.29 in ⁴ |
| D (max) | | | | | 27.00 | D-Y= | 13.50 in | | S _{xt} = | 446.98 in ³ |
| | | | | | | c= | 13.50 in | | S _{xb} = | 446.98 in ³ |
| BM WGT= | | | | | 0.159 K/Ft | | | | F _y = | 30.00 ksi |

URS Corp.
38 Chauncy St., 5th Fl.
Boston, MA 02111

Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A4 of
Calculated By: JPC Date: 06/09/2006
Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder

G1B-R

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|-----------|----------------------|----------|------------------------|-----------------------|------------------------|-------------------------|
| | | | | t | A | | | | | |
| Top Cover Plate | 14x1/2 | 50 | 14.00 | 0.250 | 3.5 in ² | 26.38 in | 92.31 in ³ | 13.13 in ³ | 0.02 in ⁴ | 602.93 in ⁴ |
| Top Angles | 2L6x6x1/2 | 80 | | | 9.2 in ² | 24.57 in | 226.04 in ³ | 11.32 in ³ | 31.84 in ⁴ | 1178.91 in ⁴ |
| Web 1 | 26x3/8 | 80 | 26.00 | 0.300 | 7.8 in ² | 13.25 in | 103.35 in ³ | 0.00 in ³ | 439.40 in ⁴ | 0.00 in ⁴ |
| Web 2 | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Bot. Angles | 2L6x6x1/2 | 80 | | | 9.2 in ² | 1.93 in | 17.76 in ³ | 11.32 in ³ | 31.84 in ⁴ | 1178.91 in ⁴ |
| Bottom Cover Plate | 14x1/2 | 50 | 14.00 | 0.250 | 3.50 in ² | 0.13 in | 0.44 in ³ | 13.13 in ³ | 0.02 in ⁴ | 602.93 in ⁴ |
| | | | | | 33.2 in ² | | 439.90 in ³ | | 503.12 in ⁴ | 3563.68 in ⁴ |
| | | | | | | Y= | 13.25 in | | I= | 4066.80 in ⁴ |
| D (max) | | | | | 26.50 | D-Y= | 13.25 in | | S _{xt} = | 306.93 in ³ |
| | | | | | | c= | 13.25 in | | S _{xb} = | 306.93 in ³ |
| BM WGT= | | | | | 0.113 K/Ft | | | | F _y = | 30.00 ksi |

URS Corp.

38 Chauncy St., 5th Fl.
Boston, MA 02111

Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A5 of
 Calculated By: JPC Date: 06/09/2006
 Checked By: LC Date: 6/23/06
 Subject: Pawtucket Support Girders

Section Properties: Built-up Girder**G2C**

| | | % Effective | Width/Depth | Thickness | Area | | | | | |
|--------------------|------------|-------------|-------------|-----------|------------|----------|-------------|-----------|--------------------|-----------------|
| | | | | t | A | y | ay | d | I | ad ² |
| Top Cover Plate | 19x11/16 | 100 | 19.00 | 0.688 | 13.1 in2 | 30.66 in | 400.45 in3 | 15.16 in3 | 0.51 in4 | 3000.61 in4 |
| Top Angles | 2L6x6x7/16 | 100 | | | 10.1 in2 | 28.65 in | 289.96 in3 | 13.15 in3 | 35.40 in4 | 1750.64 in4 |
| Web 1 | 29.625x3/8 | 100 | 29.63 | 0.375 | 11.1 in2 | 15.50 in | 172.20 in3 | 0.00 in3 | 812.50 in4 | 0.00 in4 |
| Web 2 | 29.625x3/8 | 100 | 29.63 | 0.375 | 11.1 in2 | 15.50 in | 172.20 in3 | 0.00 in3 | 812.50 in4 | 0.00 in4 |
| Bot. Angles | 2L6x6x7/16 | 100 | | | 10.1 in2 | 2.35 in | 23.76 in3 | 13.15 in3 | 35.40 in4 | 1750.64 in4 |
| Bottom Cover Plate | 19x11/16 | 100 | 19.00 | 0.688 | 13.1 in2 | 0.34 in | 4.49 in3 | 15.16 in3 | 0.51 in4 | 3000.61 in4 |
| | | | | | 68.6 in2 | | 1063.05 in3 | | 1696.84 in4 | 9502.51 in4 |
| | | | | | | Y= | 15.50 in | | I= | 11199.34 in4 |
| D (max) | | | | | 31.00 | D-Y= | 15.50 in | | S _{xt} = | 722.54 in3 |
| | | | | | | c= | 15.50 in | | S _{xtb} = | 722.54 in3 |
| BM WGT= | | | | | 0.233 K/Ft | | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343 02000

| | |
|------------------------------------|----------------------|
| Sheet No. <u>46</u> | of |
| Calculated By: JPC | Date: 06/09/2006 |
| Checked By: <u>cc</u> | Date: <u>6/23/06</u> |
| Subject: Pawtucket Support Girders | |

| Section Properties: Built-up Girder | | | G2C-R | | | | | | | |
|-------------------------------------|------------|-------------|-------------|-----------|----------|------------|------------|-----------|-------------------|-----------------|
| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
| | t | | | | A | | | | | |
| Top Cover Plate | 19x11/16 | 65 | 19.00 | 0.447 | 8.5 in2 | 30.30 in | 257.23 in3 | 15.04 in3 | 0.14 in4 | 1919.56 in4 |
| Top Angles | 2L6x6x7/16 | 55 | | | 5.6 in2 | 28.41 in | 158.14 in3 | 13.15 in3 | 19.47 in4 | 962.85 in4 |
| Web 1 | 29.625x3/8 | 50 | 29.63 | 0.188 | 5.6 in2 | 15.26 in | 84.76 in3 | 0.00 in3 | 406.25 in4 | 0.00 in4 |
| Web 2 | 29.625x3/8 | 50 | 29.63 | 0.188 | 5.6 in2 | 15.26 in | 84.76 in3 | 0.00 in3 | 406.25 in4 | 0.00 in4 |
| Bot. Angles | 2L6x6x7/16 | 55 | | | 5.6 in2 | 2.11 in | 11.73 in3 | 13.15 in3 | 19.47 in4 | 962.85 in4 |
| Bottom Cover Plate | 19x11/16 | 65 | 19.00 | 0.447 | 8.5 in2 | 0.22 in | 1.90 in3 | 15.04 in3 | 0.14 in4 | 1919.56 in4 |
| | | | | | 39.2 in2 | | 598.51 in3 | | 851.73 in4 | 5764.82 in4 |
| | | | | | | Y= | 15.26 in | | I= | 6616.54 in4 |
| | | | | | D (max) | D-Y= | 15.26 in | | S _{x1} = | 433.61 in3 |
| | | | | | | c= | 15.26 in | | S _{xy} = | 433.61 in3 |
| | | | | | BM WGT= | 0.133 K/Ft | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343.02000

| | | | |
|----------------|---------------------------|-------|----------------|
| Sheet No. | <u>A7</u> | of | |
| Calculated By: | JPC | Date: | 06/09/2006 |
| Checked By: | <u>LC</u> | Date: | <u>6/23/06</u> |
| Subject: | Pawtucket Support Girders | | |

Section Properties: Built-up Girder

G2B

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|-----------|------------|----------|-------------|-----------|-------------------|-----------------|
| | | | | t | A | | | | | |
| Top Cover Plate | 19x7/8 | 100 | 19.00 | 0.875 | 16.6 in2 | 30.56 in | 508.10 in3 | 15.06 in3 | 1.06 in4 | 3771.86 in4 |
| Top Angles | 2L6x6x3/4 | 100 | | | 16.9 in2 | 28.35 in | 478.46 in3 | 12.85 in3 | 56.40 in4 | 2785.10 in4 |
| Web 1 | 29.25x3/8 | 100 | 29.25 | 0.375 | 11.0 in2 | 15.50 in | 170.02 in3 | 0.00 in3 | 782.04 in4 | 0.00 in4 |
| Web 2 | 29.25x3/8 | 100 | 29.25 | 0.375 | 11.0 in2 | 15.50 in | 170.02 in3 | 0.00 in3 | 782.04 in4 | 0.00 in4 |
| Bot. Angles | 2L6x6x3/4 | 100 | | | 16.9 in2 | 2.66 in | 44.82 in3 | 12.85 in3 | 56.40 in4 | 2785.10 in4 |
| Bottom Cover Plate | 19x7/8 | 100 | 19.00 | 0.875 | 16.6 in2 | 0.44 in | 7.27 in3 | 15.06 in3 | 1.06 in4 | 3771.86 in4 |
| | | | | | 88.9 in2 | | 1378.69 in3 | | 1679.00 in4 | 13113.92 in4 |
| | | | | | | Y= | 15.50 in | | I= | 14792.92 in4 |
| D (max) | | | | | 31.00 | D-Y= | 15.50 in | | S _{xt} = | 954.38 in3 |
| | | | | | | c= | 15.50 in | | S _{xb} = | 954.38 in3 |
| BM WGT= | | | | | 0.303 K/Ft | | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A8 of
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Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder G2B-R

| | | % Effective | Width/Depth | Thickness | Area | | | | | |
|--------------------|-----------|-------------|-------------|-----------|------------|----------|------------|-----------|-------------------|-----------------|
| | | | | t | A | y | ay | d | I | ad ² |
| Top Cover Plate | 19x7/8 | 80 | 19.00 | 0.700 | 13.3 in2 | 30.30 in | 402.99 in3 | 14.98 in3 | 0.54 in4 | 2982.53 in4 |
| Top Angles | 2L6x6x3/4 | 65 | | | 11.0 in2 | 28.17 in | 309.08 in3 | 12.85 in3 | 36.66 in4 | 1810.31 in4 |
| Web 1 | 29.25x3/8 | 65 | 29.25 | 0.244 | 7.1 in2 | 15.33 in | 109.26 in3 | 0.00 in3 | 508.32 in4 | 0.00 in4 |
| Web 2 | 29.25x3/8 | 65 | 29.25 | 0.244 | 7.1 in2 | 15.33 in | 109.26 in3 | 0.00 in3 | 508.32 in4 | 0.00 in4 |
| Bot. Angles | 2L6x6x3/4 | 65 | | | 11.0 in2 | 2.48 in | 27.21 in3 | 12.85 in3 | 36.66 in4 | 1810.31 in4 |
| Bottom Cover Plate | 19x7/8 | 80 | 19.00 | 0.700 | 13.3 in2 | 0.35 in | 4.66 in3 | 14.98 in3 | 0.54 in4 | 2982.53 in4 |
| | | | | | 62.8 in2 | | 962.46 in3 | | 1091.06 in4 | 9585.70 in4 |
| | | | | | | Y= | 15.33 in | | I= | 10676.75 in4 |
| D (max) | | | | | 30.65 | D-Y= | 15.33 in | | S _{xt} = | 696.69 in3 |
| | | | | | | c= | 15.33 in | | S _{xb} = | 696.69 in3 |
| BM WGT= | | | | | 0.214 K/Ft | | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A9 of
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Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder G3C

| | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-------------|-------------|-----------|----------------------|----------|------------------------|-----------------------|------------------------|-------------------------|
| | | | t | A | | | | | |
| Top Cover Plate | - | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Top Angles | 2L6x6x3/8 | 100 | | 8.7 in ² | 28.36 in | 247.30 in ³ | 13.36 in ³ | 30.80 in ⁴ | 1556.43 in ⁴ |
| Web 1 | 30x3/8 | 100 | 30.00 | 11.3 in ² | 15.00 in | 168.75 in ³ | 0.00 in ³ | 843.75 in ⁴ | 0.00 in ⁴ |
| Web 2 | - | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Bot. Angles | 2L6x6x3/8 | 100 | | 8.7 in ² | 1.64 in | 14.30 in ³ | 13.36 in ³ | 30.80 in ⁴ | 1556.43 in ⁴ |
| Bottom Cover Plate | - | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| | | | | 28.7 in ² | | 430.35 in ³ | | 905.35 in ⁴ | 3112.86 in ⁴ |
| | | | | | Y= | 15.00 in | | I= | 4018.21 in ⁴ |
| D (max) | | | | 30.00 | D-Y= | 15.00 in | | S _{xt} = | 267.88 in ³ |
| | | | | | c= | 15.00 in | | S _{xb} = | 267.88 in ³ |
| BM WGT= | | | | 0.098 K/Ft | | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A10 of _____
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Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder G3C-R

| | | % Effective | Width/Depth | Thickness t | Area A | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|----------------|----------------------|------------|------------------------|-----------------------|------------------------|-------------------------|
| Top Cover Plate | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Top Angles | 2L6x6x3/8 | 60 | | | 5.2 in ² | 28.36 in | 148.38 in ³ | 13.36 in ³ | 18.48 in ⁴ | 933.86 in ⁴ |
| Web 1 | 30x3/8 | 80 | 30.00 | 0.300 | 9.0 in ² | 15.00 in | 135.00 in ³ | 0.00 in ³ | 675.00 in ⁴ | 0.00 in ⁴ |
| Web 2 | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Bot. Angles | 2L6x6x3/8 | 60 | | | 5.2 in ² | 1.64 in | 8.58 in ³ | 13.36 in ³ | 18.48 in ⁴ | 933.86 in ⁴ |
| Bottom Cover Plate | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| | | | | | 19.5 in ² | | 291.96 in ³ | | 711.96 in ⁴ | 1867.72 in ⁴ |
| | | | | | | Y= | 15.00 in | | I= | 2579.68 in ⁴ |
| | | | | | D (max) | D-Y= | 15.00 in | | S _{xt} = | 171.98 in ³ |
| | | | | | | c= | 15.00 in | | S _{xb} = | 171.98 in ³ |
| | | | | | BM WGT= | 0.066 K/Ft | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A11 of
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Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder G3B

| | | % Effective | Width/Depth | Thickness t | Area A | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|----------------|----------------------|----------|------------------------|-----------------------|------------------------|-------------------------|
| Top Cover Plate | 14x5/8 | 100 | 14.00 | 0.625 | 8.8 in ² | 29.69 in | 259.77 in ³ | 14.69 in ³ | 0.28 in ⁴ | 1887.57 in ⁴ |
| Top Angles | 2L6x6x5/8 | 100 | | | 14.2 in ² | 27.65 in | 393.11 in ³ | 12.65 in ³ | 48.40 in ⁴ | 2273.72 in ⁴ |
| Web 1 | 28.75x3/8 | 100 | 28.75 | 0.375 | 10.8 in ² | 15.00 in | 161.72 in ³ | 0.00 in ³ | 742.61 in ⁴ | 0.00 in ⁴ |
| Web 2 | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Bot. Angles | 2L6x6x5/8 | 100 | | | 14.2 in ² | 2.36 in | 33.49 in ³ | 12.65 in ³ | 48.40 in ⁴ | 2273.72 in ⁴ |
| Bottom Cover Plate | 14x5/8 | 100 | 14.00 | 0.625 | 8.8 in ² | 0.31 in | 2.73 in ³ | 14.69 in ³ | 0.28 in ⁴ | 1887.57 in ⁴ |
| | | | | | 56.7 in ² | | 850.82 in ³ | | 839.98 in ⁴ | 8322.59 in ⁴ |
| | | | | | | Y= | 15.00 in | | I= | 9162.57 in ⁴ |
| D (max) | | | | | 30.00 | D-Y= | 15.00 in | | S _{xt} = | 610.84 in ³ |
| | | | | | | c= | 15.00 in | | S _{xtb} = | 610.84 in ³ |
| BM WGT= | | | | | 0.193 K/Ft | | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A12 of
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Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder G3B-R

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|-----------|------------|----------|------------|-----------|-------------------|-----------------|
| | | | | t | A | | | | | |
| Top Cover Plate | 14x5/8 | 90 | 14.00 | 0.563 | 7.9 in2 | 29.59 in | 233.05 in3 | 14.66 in3 | 0.21 in4 | 1691.59 in4 |
| Top Angles | 2L6x6x5/8 | 80 | | | 11.4 in2 | 27.58 in | 313.78 in3 | 12.65 in3 | 38.72 in4 | 1818.98 in4 |
| Web 1 | 28.75x3/8 | 90 | 28.75 | 0.338 | 9.7 in2 | 14.94 in | 144.94 in3 | 0.00 in3 | 668.35 in4 | 0.00 in4 |
| Web 2 | - | | 0.00 | 0.000 | 0.0 in2 | 0.00 in | 0.00 in3 | 0.00 in3 | 0.00 in4 | 0.00 in4 |
| Bot. Angles | 2L6x6x5/8 | 80 | | | 11.4 in2 | 2.29 in | 26.08 in3 | 12.65 in3 | 38.72 in4 | 1818.98 in4 |
| Bottom Cover Plate | 14x5/8 | 90 | 14.00 | 0.563 | 7.9 in2 | 0.28 in | 2.21 in3 | 14.66 in3 | 0.21 in4 | 1691.59 in4 |
| | | | | | 48.2 in2 | | 720.06 in3 | | 746.21 in4 | 7021.14 in4 |
| | | | | | | Y= | 14.94 in | | I= | 7767.35 in4 |
| D (max) | | | | | 29.88 | D-Y= | 14.94 in | | S _x = | 519.99 in3 |
| | | | | | | c= | 14.94 in | | S _{xy} = | 519.99 in3 |
| BM WGT= | | | | | 0.164 K/Ft | | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A13 of _____
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Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder

G4C

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|-----------|----------------------|----------|------------------------|-----------------------|------------------------|-------------------------|
| | | | | t | A | | | | | |
| Top Cover Plate | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Top Angles | 2L6x6x3/8 | 100 | | | 8.7 in ² | 28.36 in | 247.30 in ³ | 13.36 in ³ | 30.80 in ⁴ | 1556.43 in ⁴ |
| Web 1 | 30x3/8 | 100 | 30.00 | 0.375 | 11.3 in ² | 15.00 in | 168.75 in ³ | 0.00 in ³ | 843.75 in ⁴ | 0.00 in ⁴ |
| Web 2 | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Bot. Angles | 2L6x6x3/8 | 100 | | | 8.7 in ² | 1.64 in | 14.30 in ³ | 13.36 in ³ | 30.80 in ⁴ | 1556.43 in ⁴ |
| Bottom Cover Plate | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| | | | | | 28.7 in ² | | 430.35 in ³ | | 905.35 in ⁴ | 3112.86 in ⁴ |
| | | | | | | Y= | 15.00 in | | I= | 4018.21 in ⁴ |
| | | | | | D (max) | D-Y= | 15.00 in | | S _{xt} = | 267.88 in ³ |
| | | | | | | c= | 15.00 in | | S _{xb} = | 267.88 in ³ |
| | | | | | BM WGT= | | | | F _y = | 30.00 ksi |
| | | | | | | | | | | |

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Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A14 of
Calculated By: JPC Date: 06/09/2006
Checked By: LC Date: 6/25/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder G4C-R

| | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-------------|-------------|-----------|----------------------|----------|------------------------|-----------------------|------------------------|-------------------------|
| | | | t | A | | | | | |
| Top Cover Plate | - | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Top Angles | 2L6x6x3/8 | 50 | | 4.4 in ² | 28.36 in | 123.65 in ³ | 13.36 in ³ | 15.40 in ⁴ | 778.21 in ⁴ |
| Web 1 | 30x3/8 | 80 | 30.00 | 9.0 in ² | 15.00 in | 135.00 in ³ | 0.00 in ³ | 675.00 in ⁴ | 0.00 in ⁴ |
| Web 2 | - | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Bot. Angles | 2L6x6x3/8 | 50 | | 4.4 in ² | 1.64 in | 7.15 in ³ | 13.36 in ³ | 15.40 in ⁴ | 778.21 in ⁴ |
| Bottom Cover Plate | - | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| | | | | 17.7 in ² | | 265.80 in ³ | | 705.80 in ⁴ | 1556.43 in ⁴ |
| | | | | | Y= | 15.00 in | | I= | 2262.23 in ⁴ |
| D (max) | | | | 30.00 | D-Y= | 15.00 in | | S _{xt} = | 150.82 in ³ |
| | | | | | c= | 15.00 in | | S _{xb} = | 150.82 in ³ |
| BM WGT= | | | | 0.060 K/Ft | | | | F _y = | 30.00 ksi |

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Sheet No. A15 of
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Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder G4B

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|-----------|------------|----------|------------|-----------|-------------------|-----------------|
| | | | | t | A | | | | | |
| Top Cover Plate | 14x5/8 | 100 | 14.00 | 0.625 | 8.8 in2 | 29.69 in | 259.77 in3 | 14.69 in3 | 0.28 in4 | 1887.57 in4 |
| Top Angles | 2L6x6x5/8 | 100 | | | 14.2 in2 | 27.65 in | 393.11 in3 | 12.65 in3 | 48.40 in4 | 2273.72 in4 |
| Web 1 | 28.75x3/8 | 100 | 28.75 | 0.375 | 10.8 in2 | 15.00 in | 161.72 in3 | 0.00 in3 | 742.61 in4 | 0.00 in4 |
| Web 2 | - | | 0.00 | 0.000 | 0.0 in2 | 0.00 in | 0.00 in3 | 0.00 in3 | 0.00 in4 | 0.00 in4 |
| Bot. Angles | 2L6x6x5/8 | 100 | | | 14.2 in2 | 2.36 in | 33.49 in3 | 12.65 in3 | 48.40 in4 | 2273.72 in4 |
| Bottom Cover Plate | 14x5/8 | 100 | 14.00 | 0.625 | 8.8 in2 | 0.31 in | 2.73 in3 | 14.69 in3 | 0.28 in4 | 1887.57 in4 |
| | | | | | 56.7 in2 | | 850.82 in3 | | 839.98 in4 | 8322.59 in4 |
| | | | | | | Y= | 15.00 in | | I= | 9162.57 in4 |
| D (max) | | | | | 30.00 | D-Y= | 15.00 in | | S _{x1} = | 610.84 in3 |
| | | | | | | c= | 15.00 in | | S _{x2} = | 610.84 in3 |
| BM WGT= | | | | | 0.193 K/Ft | | | | F _y = | 30.00 ksi |

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Sheet No. 416 of
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Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder G4B-R

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|-----------|------------|----------|------------|-----------|-------------------|-----------------|
| | | | | t | A | | | | | |
| Top Cover Plate | 14x5/8 | 90 | 14.00 | 0.563 | 7.9 in2 | 29.59 in | 233.05 in3 | 14.66 in3 | 0.21 in4 | 1691.59 in4 |
| Top Angles | 2L6x6x5/8 | 90 | | | 12.8 in2 | 27.58 in | 353.00 in3 | 12.65 in3 | 43.56 in4 | 2046.35 in4 |
| Web 1 | 28.75x3/8 | 90 | 28.75 | 0.338 | 9.7 in2 | 14.94 in | 144.94 in3 | 0.00 in3 | 668.35 in4 | 0.00 in4 |
| Web 2 | - | | 0.00 | 0.000 | 0.0 in2 | 0.00 in | 0.00 in3 | 0.00 in3 | 0.00 in4 | 0.00 in4 |
| Bot. Angles | 2L6x6x5/8 | 90 | | | 12.8 in2 | 2.29 in | 29.34 in3 | 12.65 in3 | 43.56 in4 | 2046.35 in4 |
| Bottom Cover Plate | 14x5/8 | 90 | 14.00 | 0.563 | 7.9 in2 | 0.28 in | 2.21 in3 | 14.66 in3 | 0.21 in4 | 1691.59 in4 |
| | | | | | 51.0 in2 | | 762.55 in3 | | 755.89 in4 | 7475.89 in4 |
| | | | | | | Y= | 14.94 in | | I= | 8231.78 in4 |
| D (max) | | | | | 29.88 | D-Y= | 14.94 in | | S _{x1} = | 551.08 in3 |
| | | | | | | c= | 14.94 in | | S _{x2} = | 551.08 in3 |
| BM WGT= | | | | | 0.174 K/Ft | | | | F _y = | 30.00 ksi |

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Boston, MA 02111

Job: Pawtucket/Central Falls 10160343.02000

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Checked By: CC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder

G5C

| | | % Effective | Width/Depth | Thickness t | Area A | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|----------------|----------------------|----------|------------------------|-----------------------|------------------------|-------------------------|
| Top Cover Plate | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Top Angles | 2L6x6x3/8 | 100 | | | 8.7 in ² | 28.36 in | 247.30 in ³ | 13.36 in ³ | 30.80 in ⁴ | 1556.43 in ⁴ |
| Web 1 | 30x3/8 | 100 | 30.00 | 0.375 | 11.3 in ² | 15.00 in | 168.75 in ³ | 0.00 in ³ | 843.75 in ⁴ | 0.00 in ⁴ |
| Web 2 | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Bot. Angles | 2L6x6x3/8 | 100 | | | 8.7 in ² | 1.64 in | 14.30 in ³ | 13.36 in ³ | 30.80 in ⁴ | 1556.43 in ⁴ |
| Bottom Cover Plate | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| | | | | | 28.7 in ² | | 430.35 in ³ | | 905.35 in ⁴ | 3112.86 in ⁴ |
| | | | | | | Y= | 15.00 in | | I= | 4018.21 in ⁴ |
| D (max) | | | | | 30.00 | D-Y= | 15.00 in | | S _{xt} = | 267.88 in ³ |
| | | | | | | c= | 15.00 in | | S _{xb} = | 267.88 in ³ |
| BM WGT= | | | | | 0.098 K/Ft | | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A18 of
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Checked By: Le Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder

G5C-R

| | | % Effective | Width/Depth | Thickness t | Area A | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|----------------|----------------------|------------|------------------------|-----------------------|------------------------|-------------------------|
| Top Cover Plate | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Top Angles | 2L6x6x3/8 | 70 | | | 6.1 in ² | 28.36 in | 173.11 in ³ | 13.36 in ³ | 21.56 in ⁴ | 1089.50 in ⁴ |
| Web 1 | 30x3/8 | 80 | 30.00 | 0.300 | 9.0 in ² | 15.00 in | 135.00 in ³ | 0.00 in ³ | 675.00 in ⁴ | 0.00 in ⁴ |
| Web 2 | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Bot. Angles | 2L6x6x3/8 | 70 | | | 6.1 in ² | 1.64 in | 10.01 in ³ | 13.36 in ³ | 21.56 in ⁴ | 1089.50 in ⁴ |
| Bottom Cover Plate | - | | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| | | | | | 21.2 in ² | | 318.12 in ³ | | 718.12 in ⁴ | 2179.00 in ⁴ |
| | | | | | | Y= | 15.00 in | | I= | 2897.12 in ⁴ |
| | | | | | D (max) | D-Y= | 15.00 in | | S _{xt} = | 193.14 in ³ |
| | | | | | | c= | 15.00 in | | S _{xb} = | 193.14 in ³ |
| | | | | | BM WGT= | 0.072 K/Ft | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A19 of
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Subject: Pawtucket Support Girders

Section Properties: Built-up Girder

G5B

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|-----------|----------------------|----------|------------------------|-----------------------|------------------------|-------------------------|
| | | | | t | A | | | | | |
| Top Cover Plate | 14x5/8 | 100 | 14.00 | 0.625 | 8.8 in ² | 29.69 in | 259.77 in ³ | 14.69 in ³ | 0.28 in ⁴ | 1887.57 in ⁴ |
| Top Angles | 2L6x6x5/8 | 100 | | | 14.2 in ² | 27.65 in | 393.11 in ³ | 12.65 in ³ | 48.40 in ⁴ | 2273.72 in ⁴ |
| Web 1 | 24x3/8 | 100 | 28.75 | 0.375 | 10.8 in ² | 15.00 in | 161.72 in ³ | 0.00 in ³ | 742.61 in ⁴ | 0.00 in ⁴ |
| Web 2 | - | - | 0.00 | 0.000 | 0.0 in ² | 0.00 in | 0.00 in ³ | 0.00 in ³ | 0.00 in ⁴ | 0.00 in ⁴ |
| Bot. Angles | 2L6x6x5/8 | 100 | | | 14.2 in ² | 2.36 in | 33.49 in ³ | 12.65 in ³ | 48.40 in ⁴ | 2273.72 in ⁴ |
| Bottom Cover Plate | 14x5/8 | 100 | 14.00 | 0.625 | 8.8 in ² | 0.31 in | 2.73 in ³ | 14.69 in ³ | 0.28 in ⁴ | 1887.57 in ⁴ |
| | | | | | 56.7 in ² | | 850.82 in ³ | | 839.98 in ⁴ | 8322.59 in ⁴ |
| | | | | | | Y= | 15.00 in | | I= | 9162.57 in ⁴ |
| D (max) | | | | | 30.00 | D-Y= | 15.00 in | | S _{xt} = | 610.84 in ³ |
| | | | | | | c= | 15.00 in | | S _{xtb} = | 610.84 in ³ |
| BM WGT= | | | | | 0.193 K/Ft | | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343.02000

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Subject: Pawtucket Support Girders

Section Properties: Built-up Girder

G5B-R

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|-----------|----------|----------|------------|-----------|-------------------|-----------------|
| | | | | t | A | | | | | |
| Top Cover Plate | 14x5/8 | 90 | 14.00 | 0.563 | 7.9 in2 | 29.59 in | 233.05 in3 | 14.66 in3 | 0.21 in4 | 1691.59 in4 |
| Top Angles | 2L6x6x5/8 | 90 | | | 12.8 in2 | 27.58 in | 353.00 in3 | 12.65 in3 | 43.56 in4 | 2046.35 in4 |
| Web 1 | 24x3/8 | 90 | 28.75 | 0.338 | 9.7 in2 | 14.94 in | 144.94 in3 | 0.00 in3 | 668.35 in4 | 0.00 in4 |
| Web 2 | - | - | 0.00 | 0.000 | 0.0 in2 | 0.00 in | 0.00 in3 | 0.00 in3 | 0.00 in4 | 0.00 in4 |
| Bot. Angles | 2L6x6x5/8 | 90 | | | 12.8 in2 | 2.29 in | 29.34 in3 | 12.65 in3 | 43.56 in4 | 2046.35 in4 |
| Bottom Cover Plate | 14x5/8 | 90 | 14.00 | 0.563 | 7.9 in2 | 0.28 in | 2.21 in3 | 14.66 in3 | 0.21 in4 | 1691.59 in4 |
| | | | | | 51.0 in2 | | 762.55 in3 | | 755.89 in4 | 7475.89 in4 |
| | | | | | | Y= | 14.94 in | | I= | 8231.78 in4 |
| | | | | | D (max) | D-Y= | 14.94 in | | S _{xt} = | 551.08 in3 |
| | | | | | | c= | 14.94 in | | S _{xt} = | 551.08 in3 |
| | | | | | BM WGT= | | | | F _y = | 30.00 ksi |
| | | | | | | | | | | |

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Job: Pawtucket/Central Falls 10160343.02000

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Subject: Pawtucket Support Girders

Section Properties: Built-up Girder

G6C

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|-----------|----------|------------|------------|-----------|-------------------|-----------------|
| | | | | t | A | | | | | |
| Top Cover Plate | 19x1/2 | 100 | 19.00 | 0.500 | 9.5 in2 | 29.75 in | 282.63 in3 | 14.75 in3 | 0.20 in4 | 2066.84 in4 |
| Top Angles | 2L6x6x1/2 | 100 | | | 11.5 in2 | 27.82 in | 319.93 in3 | 12.82 in3 | 39.80 in4 | 1890.05 in4 |
| Web 1 | 29x3/8 | 100 | 29.00 | 0.375 | 10.9 in2 | 15.00 in | 163.13 in3 | 0.00 in3 | 762.16 in4 | 0.00 in4 |
| Web 2 | 29x3/8 | 100 | 29.00 | 0.375 | 10.9 in2 | 15.00 in | 163.13 in3 | 0.00 in3 | 762.16 in4 | 0.00 in4 |
| Bot. Angles | 2L6x6x1/2 | 100 | | | 11.5 in2 | 2.18 in | 25.07 in3 | 12.82 in3 | 39.80 in4 | 1890.05 in4 |
| Bottom Cover Plate | 19x1/2 | 100 | 19.00 | 0.500 | 9.5 in2 | 0.25 in | 2.38 in3 | 14.75 in3 | 0.20 in4 | 2066.84 in4 |
| | | | | | 63.8 in2 | | 956.25 in3 | | 1604.31 in4 | 7913.79 in4 |
| | | | | | | Y= | 15.00 in | | I= | 9518.10 in4 |
| | | | | | D (max) | D-Y= | 15.00 in | | S _{xt} = | 634.54 in3 |
| | | | | | | c= | 15.00 in | | S _{xb} = | 634.54 in3 |
| | | | | | BM WGT= | 0.217 K/Ft | | | F _y = | 30.00 ksi |

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Sheet No. A22 of
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Subject: Pawtucket Support Girders

Section Properties: Built-up Girder G6C-R

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|-----------|----------|------------|------------|-----------|-------------------|-----------------|
| | | | | t | A | | | | | |
| Top Cover Plate | 19x1/2 | 80 | 19.00 | 0.400 | 7.6 in2 | 29.60 in | 224.96 in3 | 14.70 in3 | 0.10 in4 | 1642.28 in4 |
| Top Angles | 2L6x6x1/2 | 50 | | | 5.8 in2 | 27.72 in | 159.39 in3 | 12.82 in3 | 19.90 in4 | 945.03 in4 |
| Web 1 | 29x3/8 | 50 | 29.00 | 0.188 | 5.4 in2 | 14.90 in | 81.02 in3 | 0.00 in3 | 381.08 in4 | 0.00 in4 |
| Web 2 | 29x3/8 | 50 | 29.00 | 0.188 | 5.4 in2 | 14.90 in | 81.02 in3 | 0.00 in3 | 381.08 in4 | 0.00 in4 |
| Bot. Angles | 2L6x6x1/2 | 50 | | | 5.8 in2 | 2.08 in | 11.96 in3 | 12.82 in3 | 19.90 in4 | 945.03 in4 |
| Bottom Cover Plate | 19x1/2 | 80 | 19.00 | 0.400 | 7.6 in2 | 0.20 in | 1.52 in3 | 14.70 in3 | 0.10 in4 | 1642.28 in4 |
| | | | | | 37.6 in2 | | 559.87 in3 | | 802.16 in4 | 5174.62 in4 |
| | | | | | | Y= | 14.90 in | | I= | 5976.78 in4 |
| | | | | | D (max) | D-Y= | 14.90 in | | S _{xt} = | 401.13 in3 |
| | | | | | | c= | 14.90 in | | S _{xb} = | 401.13 in3 |
| | | | | | BM WGT= | 0.128 K/Ft | | | F _y = | 30.00 ksi |

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Subject: Pawtucket Support Girders

Section Properties: Built-up Girder **G6B**

| | | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-----|-------------|-------------|-----------|--------------------|---------------|-----------|-------------|------------------------------|-----------------|
| | | | | | t | A | | | | | |
| Top Cover Plate | 21x5/8 | 100 | 21.00 | 0.625 | 13.1 in2 | 30.19 in | 396.21 in3 | 14.94 in3 | 0.43 in4 | 2928.57 in4 | |
| Top Angles | 2L6x6x5/8 | 100 | | | 14.2 in2 | 28.15 in | 400.22 in3 | 12.90 in3 | 48.40 in4 | 2364.52 in4 | |
| Web 1 | 29.25x3/8 | 100 | 29.25 | 0.375 | 11.0 in2 | 15.25 in | 167.27 in3 | 0.00 in3 | 782.04 in4 | 0.00 in4 | |
| Web 2 | 29.25x3/8 | 100 | 29.25 | 0.375 | 11.0 in2 | 15.25 in | 167.27 in3 | 0.00 in3 | 782.04 in4 | 0.00 in4 | |
| Bot. Angles | 2L6x6x5/8 | 100 | | | 14.2 in2 | 2.36 in | 33.49 in3 | 12.90 in3 | 48.40 in4 | 2364.52 in4 | |
| Bottom Cover Plate | 21x5/8 | 100 | 21.00 | 0.625 | 13.1 in2 | 0.31 in | 4.10 in3 | 14.94 in3 | 0.43 in4 | 2928.57 in4 | |
| | | | | | | 76.6 in2 | 1168.57 in3 | | 1661.73 in4 | 10586.17 in4 | |
| | | | | | | | Y= 15.25 in | | | I= 12247.90 in4 | |
| | | | | | | D (max) 30.50 | D-Y= 15.25 in | | | S _{xt} = 803.14 in3 | |
| | | | | | | | c= 15.25 in | | | S _{xb} = 803.14 in3 | |
| | | | | | | BM WGT= 0.261 K/Ft | | | | F _y = 30.00 ksi | |

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Subject: Pawtucket Support Girders

Section Properties: Built-up Girder G6B-R

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|-----------|------------|----------|------------|-----------|-------------------|-----------------|
| | t | | | | A | | | | | |
| Top Cover Plate | 21x5/8 | 90 | 21.00 | 0.563 | 11.8 in2 | 30.09 in | 355.48 in3 | 14.91 in3 | 0.31 in4 | 2624.69 in4 |
| Top Angles | 2L6x6x5/8 | 60 | | | 8.5 in2 | 28.08 in | 239.60 in3 | 12.90 in3 | 29.04 in4 | 1418.71 in4 |
| Web 1 | 29.25x3/8 | 60 | 29.25 | 0.225 | 6.6 in2 | 15.19 in | 99.95 in3 | 0.00 in3 | 469.22 in4 | 0.00 in4 |
| Web 2 | 29.25x3/8 | 60 | 29.25 | 0.225 | 6.6 in2 | 15.19 in | 99.95 in3 | 0.00 in3 | 469.22 in4 | 0.00 in4 |
| Bot. Angles | 2L6x6x5/8 | 60 | | | 8.5 in2 | 2.29 in | 19.56 in3 | 12.90 in3 | 29.04 in4 | 1418.71 in4 |
| Bottom Cover Plate | 21x5/8 | 90 | 21.00 | 0.563 | 11.8 in2 | 0.28 in | 3.32 in3 | 14.91 in3 | 0.31 in4 | 2624.69 in4 |
| | | | | | 53.9 in2 | | 817.87 in3 | | 997.15 in4 | 8086.81 in4 |
| | | | | | | Y= | 15.19 in | | I= | 9083.95 in4 |
| D (max) | | | | | 30.38 | D-Y= | 15.19 in | | S _{x1} = | 598.12 in3 |
| | | | | | | c= | 15.19 in | | S _{x2} = | 598.12 in3 |
| BM WGT= | | | | | 0.183 K/Ft | | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343 02000

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Subject: Pawtucket Support Girders

| Section Properties: Built-up Girder | | | G7C | | | | | | | |
|-------------------------------------|-----------|-------------|-------------|-----------|----------------------|----------|------------------------|-----------------------|-------------------------|-------------------------|
| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
| Top Cover Plate | 15x1/2 | 100 | 15.00 | 0.500 | 7.5 in ² | 29.75 in | 223.13 in ³ | 14.75 in ³ | 0.16 in ⁴ | 1631.72 in ⁴ |
| Top Angles | 2L6x4x1/2 | 100 | | | 9.5 in ² | 27.51 in | 261.35 in ³ | 12.51 in ³ | 34.80 in ⁴ | 1486.75 in ⁴ |
| Web 1 | 29x3/8 | 100 | 29.00 | 0.375 | 10.9 in ² | 15.00 in | 163.13 in ³ | 0.00 in ³ | 762.16 in ⁴ | 0.00 in ⁴ |
| Web 2 | 29x3/8 | 100 | 29.00 | 0.375 | 10.9 in ² | 15.00 in | 163.13 in ³ | 0.00 in ³ | 762.16 in ⁴ | 0.00 in ⁴ |
| Bot. Angles | 2L6x4x1/2 | 100 | | | 9.5 in ² | 2.49 in | 23.66 in ³ | 12.51 in ³ | 34.80 in ⁴ | 1486.75 in ⁴ |
| Bottom Cover Plate | 15x1/2 | 100 | 15.00 | 0.500 | 7.5 in ² | 0.25 in | 1.88 in ³ | 14.75 in ³ | 0.16 in ⁴ | 1631.72 in ⁴ |
| | | | | | 55.8 in ² | | 836.25 in ³ | | 1594.23 in ⁴ | 6236.94 in ⁴ |
| | | | | | | Y= | 15.00 in | | I= | 7831.16 in ⁴ |
| D (max) | | | | | 30.00 | D-Y= | 15.00 in | | S _x = | 522.08 in ³ |
| | | | | | | c= | 15.00 in | | S _{xy} = | 522.08 in ³ |
| BM WGT= | | | | | 0.190 K/Ft | | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343 02000

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Subject: Pawtucket Support Girders

Section Properties: Built-up Girder

G7C-R

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|-----------|-------------|-------------|-----------|----------|----------|------------|-----------|--------------------|-----------------|
| | | | | t | A | | | | | |
| Top Cover Plate | 15x1/2 | 80 | 15.00 | 0.400 | 6.0 in2 | 29.60 in | 177.60 in3 | 14.70 in3 | 0.08 in4 | 1296.54 in4 |
| Top Angles | 2L6x4x1/2 | 80 | | | 7.6 in2 | 27.41 in | 208.32 in3 | 12.51 in3 | 27.84 in4 | 1189.40 in4 |
| Web 1 | 29x3/8 | 80 | 29.00 | 0.300 | 8.7 in2 | 14.90 in | 129.63 in3 | 0.00 in3 | 609.73 in4 | 0.00 in4 |
| Web 2 | 29x3/8 | 80 | 29.00 | 0.300 | 8.7 in2 | 14.90 in | 129.63 in3 | 0.00 in3 | 609.73 in4 | 0.00 in4 |
| Bot. Angles | 2L6x4x1/2 | 80 | | | 7.6 in2 | 2.39 in | 18.16 in3 | 12.51 in3 | 27.84 in4 | 1189.40 in4 |
| Bottom Cover Plate | 15x1/2 | 80 | 15.00 | 0.400 | 6.0 in2 | 0.20 in | 1.20 in3 | 14.70 in3 | 0.08 in4 | 1296.54 in4 |
| | | | | | 44.6 in2 | | 664.54 in3 | | 1275.29 in4 | 4971.88 in4 |
| | | | | | | Y= | 14.90 in | | I= | 6247.17 in4 |
| | | | | | D (max) | D-Y= | 14.90 in | | S _{xt} = | 419.27 in3 |
| | | | | | | c= | 14.90 in | | S _{xtb} = | 419.27 in3 |
| | | | | | BM WGT= | | | | F _y = | 30.00 ksi |
| | | | | | | | | | | |

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Sheet No. A27 of
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Subject: Pawtucket Support Girders

Section Properties: Built-up Girder

G7B

| | | % Effective | Width/Depth | Thickness | Area | | | | | |
|--------------------|-------------|-------------|-------------|-----------|----------|------------|------------|-----------|-------------------|-----------------|
| | | | | t | A | y | ay | d | I | ad ² |
| Top Cover Plate | 15x5/8 | 100 | 15.00 | 0.625 | 9.4 in2 | 29.69 in | 278.32 in3 | 14.69 in3 | 0.31 in4 | 2022.40 in4 |
| Top Angles | 2L6x3.5x1/2 | 100 | | | 9.0 in2 | 27.30 in | 245.66 in3 | 12.30 in3 | 33.20 in4 | 1360.50 in4 |
| Web 1 | 28.75x3/8 | 100 | 28.75 | 0.375 | 10.8 in2 | 15.00 in | 161.72 in3 | 0.00 in3 | 742.61 in4 | 0.00 in4 |
| Web 2 | 28.75x3/8 | 100 | 28.75 | 0.375 | 10.8 in2 | 15.00 in | 161.72 in3 | 0.00 in3 | 742.61 in4 | 0.00 in4 |
| Bot. Angles | 2L6x3.5x1/2 | 100 | | | 9.0 in2 | 2.71 in | 24.35 in3 | 12.30 in3 | 33.20 in4 | 1360.50 in4 |
| Bottom Cover Plate | 15x5/8 | 100 | 15.00 | 0.625 | 9.4 in2 | 0.31 in | 2.93 in3 | 14.69 in3 | 0.31 in4 | 2022.40 in4 |
| | | | | | 58.3 in2 | | 874.69 in3 | | 1552.24 in4 | 6765.81 in4 |
| | | | | | | Y= | 15.00 in | | I= | 8318.05 in4 |
| | | | | | D (max) | 30.00 | D-Y= | 15.00 in | S _{xt} = | 554.54 in3 |
| | | | | | | | c= | 15.00 in | S _{xb} = | 554.54 in3 |
| | | | | | BM WGT= | 0.198 K/Ft | | | F _y = | 30.00 ksi |

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Subject: Pawtucket Support Girders

Section Properties: Built-up Girder G7B-R

| | | % Effective | Width/Depth | Thickness | Area | | | | | |
|--------------------|-------------|-------------|-------------|-----------|----------|----------|------------|-----------|-------------------|-----------------|
| | | | | t | A | y | ay | d | I | ad ² |
| Top Cover Plate | 15x5/8 | 90 | 15.00 | 0.563 | 8.4 in2 | 29.59 in | 249.70 in3 | 14.66 in3 | 0.22 in4 | 1812.42 in4 |
| Top Angles | 2L6x3.5x1/2 | 90 | | | 8.1 in2 | 27.23 in | 220.58 in3 | 12.30 in3 | 29.88 in4 | 1224.45 in4 |
| Web 1 | 28.75x3/8 | 90 | 28.75 | 0.338 | 9.7 in2 | 14.94 in | 144.94 in3 | 0.00 in3 | 668.35 in4 | 0.00 in4 |
| Web 2 | 28.75x3/8 | 90 | 28.75 | 0.338 | 9.7 in2 | 14.94 in | 144.94 in3 | 0.00 in3 | 668.35 in4 | 0.00 in4 |
| Bot. Angles | 2L6x3.5x1/2 | 90 | | | 8.1 in2 | 2.64 in | 21.40 in3 | 12.30 in3 | 29.88 in4 | 1224.45 in4 |
| Bottom Cover Plate | 15x5/8 | 90 | 15.00 | 0.563 | 8.4 in2 | 0.28 in | 2.37 in3 | 14.66 in3 | 0.22 in4 | 1812.42 in4 |
| | | | | | 52.5 in2 | | 783.94 in3 | | 1396.91 in4 | 6073.75 in4 |
| | | | | | | Y= | 14.94 in | | I= | 7470.66 in4 |
| | | | | | D (max) | D-Y= | 14.94 in | | S _{xt} = | 500.13 in3 |
| | | | | | | c= | 14.94 in | | S _{xb} = | 500.13 in3 |
| | | | | | BM WGT= | | | | F _y = | 30.00 ksi |
| | | | | | | | | | | |

URS Corp.
38 Chauncy St., 5th Fl.
Boston, MA 02111

Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A29 of
Calculated By: JPC Date: 06/09/2006
Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder **G8B**

| | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|-------------------------|-------------|-------------|------------|-----------------------|----------|-------------------------|-----------------------|-------------------------|--------------------------|
| Top Cover Plate 21x1 | 100 | 21.00 | 1.000 | 21.0 in ² | 34.38 in | 721.88 in ³ | 16.94 in ³ | 1.75 in ⁴ | 6024.46 in ⁴ |
| Top Angles 2L6x6x7/8 | 100 | | | 19.5 in ² | 32.06 in | 623.79 in ³ | 14.62 in ³ | 63.80 in ⁴ | 4158.04 in ⁴ |
| Web 1 32 7/8x3/8 | 100 | 32.88 | 0.375 | 12.3 in ² | 17.44 in | 214.97 in ³ | 0.00 in ³ | 1110.32 in ⁴ | 0.00 in ⁴ |
| Web 2 32 7/8x3/8 | 100 | 32.88 | 0.375 | 12.3 in ² | 17.44 in | 214.97 in ³ | 0.00 in ³ | 1110.32 in ⁴ | 0.00 in ⁴ |
| Bot. Angles 2L6x6x7/8 | 100 | | | 19.5 in ² | 2.82 in | 54.88 in ³ | 14.62 in ³ | 63.80 in ⁴ | 4158.04 in ⁴ |
| Bottom Cover Plate 21x1 | 100 | 21.00 | 1.000 | 21.0 in ² | 0.50 in | 10.50 in ³ | 16.94 in ³ | 1.75 in ⁴ | 6024.46 in ⁴ |
| | | | | 105.6 in ² | | 1840.99 in ³ | | 2351.74 in ⁴ | 20365.00 in ⁴ |
| | | | | | Y= | 17.44 in | | I= | 22716.74 in ⁴ |
| | | D (max) | 34.88 | | D-Y= | 17.44 in | | S _{xt} = | 1302.75 in ³ |
| | | | | | c= | 17.44 in | | S _{xb} = | 1302.75 in ³ |
| | | BM WGT= | 0.359 K/Ft | | | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A30 of
Calculated By: JPC Date: 06/09/2006
Checked By: CC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder

G8B-R

| | | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|------------|--|-------------|-------------|-----------|----------|------------|-------------|-----------|-------------------|-----------------|
| | | | | | t | A | | | | | |
| Top Cover Plate | 21x1 | | 80 | 21.00 | 0.800 | 16.8 in2 | 34.08 in | 572.46 in3 | 16.84 in3 | 0.90 in4 | 4762.82 in4 |
| Top Angles | 2L6x6x7/8 | | 80 | | | 15.6 in2 | 31.86 in | 495.92 in3 | 14.62 in3 | 51.04 in4 | 3326.43 in4 |
| Web 1 | 32 7/8x3/8 | | 80 | 32.88 | 0.300 | 9.9 in2 | 17.24 in | 170.00 in3 | 0.00 in3 | 888.25 in4 | 0.00 in4 |
| Web 2 | 32 7/8x3/8 | | 80 | 32.88 | 0.300 | 9.9 in2 | 17.24 in | 170.00 in3 | 0.00 in3 | 888.25 in4 | 0.00 in4 |
| Bot. Angles | 2L6x6x7/8 | | 80 | | | 15.6 in2 | 2.62 in | 40.79 in3 | 14.62 in3 | 51.04 in4 | 3326.43 in4 |
| Bottom Cover Plate | 21x1 | | 80 | 21.00 | 0.800 | 16.8 in2 | 0.40 in | 6.72 in3 | 16.84 in3 | 0.90 in4 | 4762.82 in4 |
| | | | | | | 84.5 in2 | | 1455.90 in3 | | 1880.38 in4 | 16178.52 in4 |
| | | | | | | | Y= | 17.24 in | | I= | 18058.90 in4 |
| | | | | | | D (max) | D-Y= | 17.24 in | | S _x = | 1047.65 in3 |
| | | | | | | | c= | 17.24 in | | S _{xy} = | 1047.65 in3 |
| | | | | | | BM WGT= | 0.287 K/Ft | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A31 of
Calculated By: JPC Date: 06/09/2006
Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder G8C

| | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|---------------------------|-------------|-------------|-----------|------------|----------|------------|-----------|-------------------|-----------------|
| | | | t | A | | | | | |
| Top Cover Plate 21x3/8 | 100 | 21.00 | 0.375 | 7.9 in2 | 30.81 in | 242.65 in3 | 15.31 in3 | 0.09 in4 | 1846.47 in4 |
| Top Angles 2L6x3 1/2x3/8 | 100 | | | 6.8 in2 | 28.59 in | 195.52 in3 | 13.09 in3 | 25.80 in4 | 1171.13 in4 |
| Web 1 30.25x3/8 | 100 | 30.25 | 0.375 | 11.3 in2 | 15.50 in | 175.83 in3 | 0.00 in3 | 865.02 in4 | 0.00 in4 |
| Web 2 30.25x3/8 | 100 | 30.25 | 0.375 | 11.3 in2 | 15.50 in | 175.83 in3 | 0.00 in3 | 865.02 in4 | 0.00 in4 |
| Bot. Angles 2L6x3 1/2x3/8 | 100 | | | 6.8 in2 | 2.42 in | 16.52 in3 | 13.09 in3 | 25.80 in4 | 1171.13 in4 |
| Bottom Cover Plate 21x3/8 | 100 | 21.00 | 0.375 | 7.9 in2 | 0.19 in | 1.48 in3 | 15.31 in3 | 0.09 in4 | 1846.47 in4 |
| | | | | 52.1 in2 | | 807.82 in3 | | 1781.82 in4 | 6035.20 in4 |
| | | | | | Y= | 15.50 in | | I= | 7817.02 in4 |
| | | | D (max) | 31.00 | D-Y= | 15.50 in | | S _{xt} = | 504.32 in3 |
| | | | | | c= | 15.50 in | | S _{xb} = | 504.32 in3 |
| | | | BM WGT= | 0.177 K/Ft | | | | F _y = | 30.00 ksi |

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Job: Pawtucket/Central Falls 10160343.02000

Sheet No. A32 of A32
Calculated By: JPC Date: 06/09/2006
Checked By: LC Date: 6/23/06
Subject: Pawtucket Support Girders

Section Properties: Built-up Girder

G8C-R

| | | % Effective | Width/Depth | Thickness | Area | y | ay | d | I | ad ² |
|--------------------|---------------|-------------|-------------|-----------|------------|----------|------------|-----------|-------------------|-----------------|
| | t | | | | A | | | | | |
| Top Cover Plate | 21x3/8 | 50 | 21.00 | 0.188 | 3.9 in2 | 30.53 in | 120.22 in3 | 15.22 in3 | 0.01 in4 | 911.97 in4 |
| Top Angles | 2L6x3 1/2x3/8 | 50 | | | 3.4 in2 | 28.40 in | 97.12 in3 | 13.09 in3 | 12.90 in4 | 585.56 in4 |
| Web 1 | 30.25x3/8 | 80 | 30.25 | 0.300 | 9.1 in2 | 15.31 in | 138.96 in3 | 0.00 in3 | 692.02 in4 | 0.00 in4 |
| Web 2 | 30.25x3/8 | 80 | 30.25 | 0.300 | 9.1 in2 | 15.31 in | 138.96 in3 | 0.00 in3 | 692.02 in4 | 0.00 in4 |
| Bot. Angles | 2L6x3 1/2x3/8 | 50 | | | 3.4 in2 | 2.23 in | 7.62 in3 | 13.09 in3 | 12.90 in4 | 585.56 in4 |
| Bottom Cover Plate | 21x3/8 | 50 | 21.00 | 0.188 | 3.9 in2 | 0.09 in | 0.37 in3 | 15.22 in3 | 0.01 in4 | 911.97 in4 |
| | | | | | 32.9 in2 | | 503.25 in3 | | 1409.86 in4 | 2995.06 in4 |
| | | | | | | Y= | 15.31 in | | I= | 4404.91 in4 |
| D (max) | | | | | 30.63 | D-Y= | 15.31 in | | S _{xt} = | 287.67 in3 |
| | | | | | | c= | 15.31 in | | S _{xb} = | 287.67 in3 |
| BM WGT= | | | | | 0.112 K/Ft | | | | F _y = | 30.00 ksi |

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